

Resilience over recovery: A feasibility study on a self-taught resilience programme for paramedics

by

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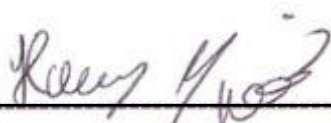
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ABSTRACT

Research within the last 20 years has suggested that the prevalence of post-traumatic stress disorder (PTSD) is greater in paramedics than the general population. However, while treatment options are available, there are few approaches aiming to prevent or reduce the onset of PTSD by fostering resilience. Research suggests that resilience training may be promising in reducing rates of mental distress such as PTSD, and that digitally supported self-administered learning and therapies are effective in treating mental distress in a variety of population groups. In accordance with MRC guidelines on developing and evaluating an intervention, my thesis aimed to develop a self-taught resilience promoting intervention delivered by a computer platform, and implement this in the course of a feasibility study using paramedic students. The intervention is referred to as 'self-taught digital resilience training' (STDRT).

An exploratory sequential design was used to develop a resilience fostering intervention; starting with a narrative literature review and qualitative online forum study. The narrative literature review highlighted resilience factors across a variety of populations, while the online forum study identified resilience factors specific to paramedics. There were 583 forum users across 87 forum threads in total. Together, these qualitative studies informed the development of the STDRT designed to teach resilience to paramedics. A feasibility study was then conducted to evaluate the STDRT in order to obtain information pertaining to the feasibility of a randomised controlled trial (RCT). This involved the administration of the STDRT to a sample of five paramedic students while their resilience and trauma symptomology were measured before and after 6 months. The outcome suggested that a larger scale RCT is viable. Additionally, preliminary results suggested that the STDRT may be effective in increasing resilience, but not reducing PTSD associated with chronic trauma.

Therefore, a follow-up main RCT is feasible. The thesis contains further conclusions and original contributions to knowledge. I propose that resilience is not a fixed universal trait, but varies in its properties depending on individuals or groups. Additionally, I conclude that the chronic stressors that paramedics face across their work are associated with forms of PTSD more characterised by affective symptoms. Furthermore, the historical account of PTSD in paramedics, the narrative literature review and online forum study stand alone as original pieces of research, as well as contributing to the thesis overall.

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ABBREVIATIONS

APA	American Psychological Association
BBC	British Broadcasting Corporation
CAPS	Clinician Administered PTSD Scale
CBT	Cognitive Behavioural Therapy
CD-RISC-25	Connor-Davidson Resilience Scale
CIS	Checklist Individual Strength
CISD	Critical Incident Stress Debriefing
CISM	Critical Incident Stress Management
CPTSD	Complex Post-Traumatic Stress Disorder
CSF	Comprehensive Soldier Fitness
DPFPSH	Digital Program for Psychological Self-Help
DSM	Diagnostic and Statistical Manual of Mental Disorders
DTS	Davidson Trauma Scale
EMDR	Eye Movement Desensitisation and Reprocessing
EMS	Emergency Medical Services
EMT	Emergency Medical Technicians
ICC	Intraclass Correlation Coefficient
ICD	International Statistical Classification of Diseases and Related Health Problems
iCT-R	Internet-delivered Cognitive Training for Resilience
MANOVA	Multivariate Analysis of Variance
MDD	Major Depressive Disorder
NIHR	National Institute for Health Research
NHS	National Health Service
NWAS	North West Ambulance Service
OADR	Old Age Dependency Ratio

PCL	PTSD Checklist
PhD	Doctor of Philosophy
PTSD	Post-Traumatic Stress Disorder
RCT	Randomised Controlled Trial
SCID	Structured Clinical Interview for DSM Disorders
SSRI	Selective Serotonin Re-uptake Inhibitor
STDRT	Self-Taught Digital Resilience Training
STEMH	Science, Technology, Engineering, Medicine and Health
SWLS	Satisfaction With Life Scale
TIA	Trauma Informed Approach
UCLan	University of Central Lancashire
UK	United Kingdom
US	United States
WHO	World Health Organisation

CHAPTER 1: BACKGROUND TO THE RESEARCH

1.1 Introduction

My work in this thesis focuses upon the psychosocial stress within the work of paramedics, given that paramedics encounter more traumatic events compared to the general population (Regehr, Goldberg & Hughes, 2002). A proposed means for strengthening resilience is developed via a digital training program. This is referred to as the ‘self-taught digital resilience training’ (STDRT)¹. This was developed with the aid of qualitative research on the work trauma and resiliency factors associated with paramedics. To investigate the viability for a complete randomised controlled trial (RCT) to test the effectiveness of this program, I designed a feasibility study using student paramedics. The results from this feasibility study suggested that an RCT is indeed feasible. Additionally, preliminary results were obtained on the effectiveness of the STDRT itself.

1.1.1 Paramedics, Occupational Stress and Post Traumatic Stress Disorder

The definition of post-traumatic stress disorder (PTSD) has changed over the years depending on the systems such as the Diagnostic and Statistical Manual of Mental Disorders (DSM) and the International Statistical Classification of Diseases and Related Health Problems (ICD). Generally, PTSD is described as a form of mental illness caused by extremely stressful events, characterised by intrusive flashbacks, avoidance, numbing and distortedly high arousal (Friedman, 2013; Lasiuk & Hegadoren, 2006). The terminology used within this definition can be further explained. The identification of an ‘extremely stressful event’ additionally varies across different diagnostic criteria.

¹ This is included in an external USB drive attached to the thesis.

By and large this includes combat exposure, terrorist attacks, natural disasters, child abuse and physical or sexual assault (Javidi & Yadollahie, 2012).

Intrusive flashbacks are often described as being multisensory image-based memories triggered by reminders of the initial traumatic event (Brewin et al., 2009). This results in the traumatic events being re-experienced in the present instead of the past, either while awake or during sleep as nightmares (Brewin et al., 2009). Avoidance is attributed to the increased tendency to evade activities, locations and/ or people that remind affected individuals of the initial traumatic event (Thompson & Waltz, 2008). Numbing reflects the loss of emotion, in particular positive feelings, by those with PTSD (Foa, Riggs & Gershuny, 1995). High arousal is viewed as excessive physiological and psychological activation, such as increased heart rates and 'being on guard' abnormally often (Woodward, Murbung & Bliwise, 2000). The exact conception of these symptoms, as well as other related symptoms, varies across different periods and diagnostic manuals.

Over the past 15 to 20 years, an increasing body of research suggests that the prevalence of PTSD is greater in paramedics than the general population (Alexander & Klein, 2001; Clompus & Albarra, 2015; Fjeldheim et al., 2014; Gayton & Lovell, 2012; Ogińska-Bulik & Kobylarczyk, 2015). This research tends to indicate that the rate of PTSD in paramedics is between 15 to 25%, while rates are between 1.5 to 4% in the general population of most Western countries (Briere, Agee & Dietrich, 2016; Lukaschek et al., 2013). It is apparent that the fundamental reason why paramedics are more vulnerable to PTSD compared to the general population is due to critical incidents. 'Critical incidents' in this context refers to the exposure to traumatic events on duty that may evoke intense emotions and elicit responses associated with PTSD (Halpern, Maunder, Schwartz & Gurevich, 2012). Due to the work requirements of paramedics to

provide first response treatment and transportation to injured people, they are exposed to critical incidents more than the general population, and therefore display greater rates of PTSD than the general population.

While PTSD is one of the more extreme consequences of exposure to critical incidents, there are other forms of mental disorders and distress that may also be caused by critical incidents, often with overlapping symptomology (Bennett et al., 2005). These include depression, anxiety (Bennett et al., 2005), burnout (Boudoukha, et al., 2013) and chronic fatigue syndrome (Nater, Maloney, Heim & Reeves, 2011). A distinction between the terms mental disorder and mental distress is needed. The two terms possess distinct categorical differences, and should avoid being freely interchanged with each other (Payton, 2009). For this thesis, ‘mental disorders’ shall be defined as a disturbance in psychological wellbeing as listed in diagnostic systems such as DSM and ICD. This would for instance include depression, anxiety and PTSD. Additionally for this thesis, ‘mental distress’ will be defined as a disturbance in psychological wellbeing that is not necessarily listed in a diagnostic system². Burnout for example is typically identified as a form of detriment to mental health (Boudoukha, et al., 2013) that is not listed under DSM, and listed under ICD-11 as an ‘occupational phenomenon’ rather than a medical condition (WHO, 2020). The term ‘mental distress’ can also be used in conjunction with trauma informed approaches (TIA) that aim to avoid psychological labels (see Chapter 10, Section 10.5.1). In order to cover psychological disturbances both listed in diagnostic systems and not listed in diagnostic systems, this thesis shall use the term ‘mental distress’, unless specifically referring to detriment to psychological wellbeing as described in DSM or ICD. However, this does not preclude those who experience

² It is also worth noting that commentators critical of a perceived unhelpful dominance of biological psychiatry often use the term mental distress as a catch all substitute for notions of mental disorder or mental illness (Lewis-Fernández & Kirmayer, 2019; Ramon, 2018; Rose, 2018).

mental distress from needing mental health treatment and support (Gulliver, Griffiths, Christensen & Brewer, 2012).

The effect of critical incidents on the psychological wellbeing of paramedics appears to be worsening in the United Kingdom (UK) since 2013, according to the grey literature (Campbell, 2017; see Chapter 3). There appears to be a multitude of reasons for this, such as governmental financial cuts, lack of opportunity to debrief (Ullah, 2015), intense work targets (Campbell, 2017) and increasing working hours (UNISON, 2013). Furthermore, the mental distress experienced by emergency first responders has received a greater focus in the aftermath of major disasters over the past twenty years. These include the terrorist attack on the World Trade Centre (Beaton, Murphy, Johnson & Nemuth, 2004), the Asian tsunami of 2004 (Udomratn, 2008), the Manchester Arena bombing and the Grenfell Tower fire (Gilroy, 2018).

Therefore, it can be said that a wide range of external factors are prominently responsible for the rise of occupational trauma symptomology in paramedics. To help overcome these particular issues, it seems that structural changes are needed in the emergency services, as well as an increase in funding, and greater access to mental health treatment services (UNISON, 2013). While wider governmental projects should consider focusing on these efforts, my Doctor of Philosophy (PhD) project did not aim to resolve these issues, but to conduct a feasibility study exploring resilience training in a sample of student paramedics. This should provide knowledge and insight on the use of resilience training in reducing rates of occupational trauma and PTSD.

It should be noted that exposure to critical incidents does not necessarily result in PTSD. Determining the exact causal factors that influence the probability of the onset of PTSD after exposures to critical incidents is an important research area that still has room for further findings (Agaibi & Wilson, 2005). The intensity and form of the

critical incident is cited as one factor that may determine this (Breslau et al., 2004). Additionally, traumatic events may result in forms of mental distress associated with PTSD. These may include variations of stress, anxiety and depression (De Boer et al., 2011). However, while this is distressing for the affected individuals, they may not display symptom severity profound enough to meet the diagnostic criteria for PTSD. This form of mental distress is therefore referred to as ‘PTSD symptomology’ throughout the thesis. Furthermore, individual differences appear to be associated with resilient to the onset of PTSD after critical incidents (Hoge, Austin & Pollack, 2007). While there appears to be no standardised definition of resilience at the present, it can in some forms be defined as a set of processes that enables good outcomes in spite of serious threats (Reivich, Seligman & McBride, 2011). The definitions of resilience and the role this plays in reducing the onset of PTSD and related symptomology is discussed further within the thesis.

Analysing and changing the mental processing of individuals in order to overcome psychological disorders has been well researched. This has produced standardised psychological treatments, such as cognitive behavioural therapy (CBT) (Sheldon, 2011). However, psychological prevention measures such as resilience have not been conducted and researched to the same extent. A fair amount of research has been conducted evaluating the Penn Resiliency Program aimed at fostering resilience in schoolchildren (Brunwasser, Gillham & Kim, 2009; Brunwasser & Gillham, 2018). Additionally, similar research has investigated the effectiveness of a resilience program in the United States (US) military that was implemented in 2009 (Cacioppo et al., 2015; Lester et al., 2011; Steenkamp et al., 2013). However, there has been less research in both general populations and in population groups who, likewise to soldiers, are also at high risk of stress-related mental illnesses (Cuijpers, van Straten, Smit, Mihalopoulos &

Beekman, 2008). Therefore, I aimed to investigate resilience in paramedics to help amend this gap in the literature.

1.2 Thesis Structure

My project aimed to investigate the nature of resilience and PTSD in paramedics. This was done so with a review of the literature and several different research projects. Two of these projects were considered the main project of the thesis. One was the online forum study, which aimed to investigate stressors, resilience and coping mechanisms in paramedics. The other was the feasibility study, which aimed to test the feasibility of an RCT for a digital program designed to increase resilience in paramedics. This was the STDRT, developed independently by me. This thesis also explores and outlines other important areas such as the history of PTSD in paramedics, and the nature of work stress in paramedics in the UK at present. The different chapters in this thesis will reflect these different aims. Hence, the structure of the different chapters will be outlined below.

1.2.1 Chapter 2: A History of Post-Traumatic Stress Disorder, Diagnosis and Conceptual Issues in Relation to Paramedics.

This chapter provides an outline of the history and conceptual issues of PTSD. This describes the development from the late 19th Century and early 20th Century conceptions into the modern conception of PTSD. Additionally, this discusses how the criteria changes in DSM-IV was influential in PTSD being diagnosed in paramedics. This also discusses how both DSM-5 and ICD-11 is better suited to the experiences and symptomology in paramedics due to the acknowledgement of chronic work trauma. Furthermore, the chapter discusses the conceptual issues of PTSD, and disputes whether PTSD is a real-world entity or a fictionalised construct. PTSD as an entity seems to be

somewhere between a real disorder with a set aetiology and a Western conception influenced by societal and political factors.

1.2.2 Chapter 3: Work Stress and Trauma in Paramedics: The Last Decade.

The third chapter outlines the current issues that paramedics face that contribute to their trauma and PTSD in the UK. This is mostly provided by grey literature, which suggests that the work conditions resulting in greater rates of trauma and PTSD in paramedics have worsened in the last decade. This chapter provides a summary of the overall issues that the grey literature has reported. This suggests that mental distress in paramedics in the UK is becoming worse due to austerity-based policies and an ageing population. Unless further measures are taken, these issues could become worse.

1.2.3 Chapter 4: Digital Programs for Mental Distress.

In this chapter, the increase in the use of digital programs for mental distress will be outlined. This will discuss the usefulness and limitations, as observed in research investigating them. In particular, the possibilities for their use in paramedics to potentially help reduce PTSD symptoms will be discussed. While very recent research is testing the use of digital programs to train resilience in paramedics, the current project aims to test a program designed to provide resilience that is more specific to paramedics rather than a general definition of resilience.

1.2.4 Chapter 5: A Narrative Review of Literature Pertaining to Resilience, Occupational Trauma and Digital Interventions.

Here, I present a narrative review of the literature for the three main strands of this project: Occupational stress and trauma in paramedics, resilience and digital programs for mental distress. This chapter provides the search strategies, summaries of included literature and outline how they provide the framework that justifies the conduct

of the current project. The connectivity of these strands contributes to the originality of this project. While the narrative literature review was used to identify a gap in the research and justify the commencement of my study, the information obtained from this was also used to identify factors of resilience that could be incorporated into the STDRT. In this sense, the narrative literature review has its own methodology and sits within the overall methodology of the project. An account of the methodological approach to the narrative literature review thus could have instead been located within the methodology chapter of this thesis (Chapter 7). However, given its importance in justifying the commencement of my study and informing the development of the STDRT, I have placed this narrative literature review in its own chapter here; appearing before the methodology chapter.

1.2.5 Chapter 6: Designing the Self-Taught Digital Resilience Training.

In this chapter, the development of the STDRT was outlined. The first part of this chapter outlines how the narrative literature review contributed to the STDRT. The second part of this chapter outlines how the online forum study contributed to the design of the STDRT. This was mostly focused on internal factors of resilience due to the functionality of the STDRT, but some factors of external resilience were also incorporated. Because there were a number of iterations of the STDRT (informed by the wider literature, the online forum study and the feedback study) this complicated the decision regarding where to account for the development of the STDRT within the overall structure of this thesis. Structuring my thesis in this manner, describing the STDRT development following the account of the narrative literature review but before methodology, may depart in some way from the chronological order of which this project was conducted. However, I decided that the rationale and flow of the thesis would be improved by placing this chapter in this order. To assist with the logical

exposition of ideas, I felt it was apposite to bring into one chapter the various stages of development of the STDRT and that this was best placed following the narrative literature review. Given that the feasibility study is focused on the use of the STDRT, I felt that its development was best introduced earlier in the thesis. The chapter presents screenshots of the visual designs of the STDRT as well as the intellectual content and psychological functions that were presented within this.

1.2.6 Chapter 7: Methodology.

This chapter outlines the methodology used in the main studies comprising the totality of the project. A sequential exploratory design was used to form a resilience fostering intervention, informed by the literature and a qualitative online forum study, followed by a quantitative study to evaluate its feasibility. This chapter accounts for the methodology of both the initial qualitative study and the subsequent quantitative feasibility study. The online forum study involved qualitative analysis of participatory forums designed for paramedics to discuss issues around work stress and mental distress. This served as both an original stand-alone study with wider implications, and a method of researching resilience factors more specific to paramedics that were incorporated into the STDRT. The feasibility study provided a sample of paramedic students with the STDRT, and tested their levels of resilience, PTSD and chronic stress scores with psychometric measures before and after 6 months.

1.2.7 Chapter 8: Results.

This chapter provides the results of the studies performed within the sequential exploratory design, namely the online forum study and the feasibility study. The online forum study identified a number of resilience factors associated with paramedics. Additionally, this study suggested that resilience may not be a fixed, universal trait, but is comprised of factors more related to the specific individuals and groups. Other

observations were made about the way in which paramedics face and cope with trauma, and several findings could be further investigated with follow-up research. The feasibility study suggested that a main trial for the STDRT would indeed be feasible. Also, preliminary results suggested that there may be a dissociation between acute trauma and PTSD characterised by hyperarousal symptoms, and chronic trauma and PTSD characterised by affective symptomology.

1.2.8 Chapter 9: Discussion.

This chapter provides a discussion of the results observed in the sequential exploratory analysis. For the online forum study, the wider implications of the results are discussed, as well as how they were applied to the STDRT. Limitations of this design were also considered, such as the effect of cultural differences and the disadvantages of an online forum study. For the feasibility study, a discussion about the feasibility of a main trial is provided, along with issues and limitations with this study, and improvements that would have to be made to ensure that a sufficient level of participants are recruited. Whilst not crucial to considerations of feasibility, the implications of the preliminary results of effectiveness are also discussed.

1.2.9 Chapter 10: General Discussion: Implications and Future Directions.

This chapter draws together the various findings within my thesis to discuss the original contribution to knowledge provided, theoretical implications and future directions. This account highlights the original documentation of the history and conceptualisation of PTSD in paramedics, and calls for an increased emphasis on researching chronic stress and PTSD characterised by affective symptoms in paramedics. This chapter also states that a new measure is required for PTSD specifically for paramedics. Similarly, it is argued that TIA should also be considered for future practice and research development. I also discuss the potential for the STDRT

to be used in further research, and discuss the implications of the definition of resilience based on the findings of my studies.

1.2.10 Chapter 11: Conclusions

The conclusion chapter synthesises and summarises the contents of the thesis. This involves a proposal for the redefinition of resilience, a discussion of medical models of PTSD and TIA, and the potential aetiology of work trauma in paramedics in the future. This chapter also provides a reflection on the personal and intellectual journey I undertook in the process of conducting the research and writing the thesis for this PhD project.

CHAPTER 2: A HISTORY OF POST-TRAUMATIC STRESS DISORDER, DIAGNOSIS AND CONCEPTUAL ISSUES IN RELATION TO PARAMEDICS

2.1 Introduction

This chapter will provide an outline of the history of PTSD, how it became a diagnosable condition, and how PTSD became diagnosable in paramedics. In order to further understand the history of PTSD in paramedics, it is important to ascertain a history of PTSD overall and how the concept has emerged and has been developed over time. This chapter will provide an outline of the diagnosed symptoms across different classifications, changes due to political and historical events, and conceptual issues in the classification of PTSD. These conceptual issues will be further framed by their potential implications for the PTSD observed in paramedics. I will provide a commentary on the conceptual issues on the validity of PTSD by outlining and critiquing three different schools of thought on the subject. The various psychiatric taxonomic diagnostic manuals have altered their approach to traumatic experiences and related symptomology over time. This has both complicated research into PTSD by changing classificatory criteria and opened up opportunities to consider occupational stress and trauma afresh.

2.2 1870-1918: A Biological Theory in a Military Context

The foundations of PTSD as a diagnosable condition originated in the late 19th century. Research during this period began with physiological studies on military soldiers. Arthur Myers (1870), who was an assistant surgeon for the Coldstream Guards, and Jacob Mendez Da Costa (1871), an army surgeon in the American Civil War, both noted physiological symptoms in soldiers that appeared to be caused by the stresses of war (Lasiuk & Hegadoren, 2006). Recorded symptoms included migraines, sweating, fatigue, tremors, palpitations and dyspnoea. Myers proposed the term ‘soldier’s heart’

while Da Costa similarly noted this as ‘irritable heart’. Indeed, Myers’ resultant research presents these symptoms as underpinnings of heart disease, rather than a form of mental distress.

“The special heart disease from which the young soldier suffers is not, we are informed, disease of the valves, but an extreme excitability of the heart, combined with some, but not great, enlargement. During rest a heart of this kind bears easily, but on the least exertion its action becomes irregular, and the man becomes breathless.” (Myers, 1870; p. 39)

“Shortly after the establishment of military hospitals in our large cities, I was appointed visiting physician to one in Philadelphia, and there I noticed cases of a peculiar form of functional disorder of the heart, to which I gave the name of irritable heart...” (Da Costa, 1871; p. 559)

“Nervous Disorders.—These manifested themselves chiefly by headache, giddiness, disturbed sleep; and were symptoms which, though common, were not so constant as those already described. The headache was not apt to be persistent, but to occur in spells, and was generally of a dull, heavy character. It was more particularly noticed after severe attacks of palpitation; and might be associated with giddiness, and with increased heat and redness of face.” (Da Costa, 1871; p. 563)

The stringent adherence to explaining this phenomenon in biological terms, rather than psychological terms, is in part because psychology was still in its infancy as an academic or public discipline. To illustrate, Wilhelm Wundt published *Principles of physiological psychology* in 1873, and Sigmund Freud published *The aetiology of hysteria* in 1896. Thus, psychology was in its infancy as an academic discipline around the same time as Myers and Da Costa were researching distress in soldiers, and psychology started addressing the issue of mental illness some twenty years later. Additionally, the biological explanations for this resonated with the cultural ideas of the time. Specifically, soldiers were expected to be brave in battle, and reluctance to fight was seen as cowardice (Leese, 2002; Schindler, 2018). Therefore, a biological explanation of symptoms was seen as acceptable, and meant that soldiers’ self-respect was not ruined, military authorities did not have to punish their soldiers for cowardice,

and politicians avoided the task of re-thinking the meaning of war itself (Lasiuk & Hegadoren, 2006; Van der Kolk, McFarlane & Weisaeth, 1998). However, this approach did not always absolve affected individuals. Many soldiers were still punished and executed for cowardice, while higher-ranking officers were more likely but not guaranteed to receive treatment through biological explanations (Leese, 2002; Reid, 2014).

Biological explanations for the visible distress of soldiers were still being favoured during the First World War. As the first global industrialized war, this event produced a devastatingly high number of casualties between 1914 and 1918. Many suffered horrific injuries due to new industrial weapons such as the machine gun and chemical gas-based weapons (Backstein & Hinek, 2005; Fitzgerald, 2008; Jones, 2006). A British military psychiatrist, Charles Meyers (1915) hypothesised that exploding shells causes ruptures in small blood vessels that leads to this symptomology. Thus, he proposed the term 'shell shock' (Lasiuk & Hegadoren, 2006; Meyers, 1915; Winter, 2000):

"Comment on these cases seems superfluous. They appear to constitute a definite class among others arising from the effects of shell-shock. The shells in question appear to have burst with considerable noise, scattering much dust..." (Meyers, 1915; p. 320)

This concept however struggled to explain why similar symptomology was present in soldiers who had not directly engaged in battle, as Meyers himself acknowledges:

"...but this was not attended by the production of odour. It is therefore difficult to understand why hearing should be (practically) unaffected, and the dissociated 'complex' be confined to the senses of sight, smell, and taste (and to memory). The close relation of these cases to those of 'hysteria' appears fairly certain." (Meyers, 1915; p. 320)

Despite Meyers's (1915) suggestion that shell shock was linked in some way to hysteria, a psychological component for this was not fully put forward at the time. Thus, tragically 306 British soldiers were executed for cowardice during the First World War, many of who are now believed to have been suffering from PTSD (Fenton, 2006).

2.3 Post World War One: Kardiner and Psychological Theories

It was not until after the First World War that this effect of the stresses of war on the health of soldiers became viewed through the prism of psychology as well as biology. An influential figure was Abram Kardiner, an American student of Sigmund Freud who treated trauma in war veterans during the 1920s (Farber, 1981; Lasiuk & Hegadoren, 2006; Young, 1997). Using a psychoanalytic approach to trauma in war veterans, he observed that distressed soldiers frequently displayed both amnesia of the traumatic event, and simultaneously behaved as if it was still occurring (Kardiner, 1941). Kardiner further observed that there was often no physical damage inflicted on the soldiers who displayed these symptoms, and he observed that the symptoms could be delayed or immediate, and chronic or acute depending on the individual. Thus, he hypothesised that the symptoms of amnesia and physical arousal were not due to biological damage, but due to psychological damage (Kardiner, 1941). Kardiner coined the 'psychological disturbance of war' as *traumatic neurosis*.

"A second point of view exploited in connection with this symptom complex was that the traumatic neurosis was 'psychogenic' in character...One group of authors elected to describe the illness as due to specific conflicts occasioned by the war situation as against the peacetime situation; that is, the peacetime ego was contrasted with the wartime ego, and the conflicts were entirely in terms of the issue of self-preservation as against ideals of heroism, patriotism, and the like." (Kardiner, 1941; p. 4)

"Case 6. This patient was twenty-four years old. There was no history of neurotic traits...During his service in the army he suffered but one injury and that not a serious one; he was mildly gassed on one occasion. As a result of this, he had a mild chronic bronchitis...The neurosis began several days after he

had been removed to the hospital, following his gassing (1917) and was initiated by anxiety dreams of the horrible scenes he had witnessed in the trenches. Several days later he had the first of these twilight terrors which persisted for five years thereafter. During this interval of five years he dreamed frequently of war scenes, always with anxiety.” (Kardiner, 1941; pp. 16-17)

Despite Kardiner’s ground-breaking work and increased interest in the subject matter during the Second World War, the psychiatric establishment did not publish any official classification of this as a mental distress at this time (Young, 1997). While collective interest in this *traumatic neurosis* of soldiers was declining during the early Cold War, independent researchers and clinicians separately investigated psychological trauma in Holocaust survivors, rape survivors and abused children (Burgess & Holmstrom, 1974; Gray et al., 1977; Krystal & Niederland, 1968; Lasiuk & Hegadoren, 2006; Nathan, Eitinger & Winnik, 1963). These studies produced disparate information about particular sub-types of psychological trauma with little overall unity.

2.4 The Vietnam War and DSM-III

A reignited and unified interest in psychological trauma came in the backdrop of the US involvement in the Vietnam War (Young, 1997). Since the decision of President Lyndon B. Johnson to send US combat forces in March 1965, an estimated 26% of the 2,709,918 Americans who served in Vietnam are believed to have shown trauma symptomology (Price, 2016). Both the numbers of those affected, and the intensity of symptomology is reported to be greater than that of soldiers in the Second World War (Miller, Goreczny, & Perconte, 1992). This may be due to the anti-war culture surrounding that particular conflict, causing an unsupportive environment for soldiers to return to. Consequently, there was a profound increase in research into the psychological trauma of war (DeFazio, 1975; Horowitz & Solomon, 1975; Shatan, 1973). Mardi Horowitz was particularly influential in producing information-processing mental models to help explain the onset of psychological distress after traumatic

experiences in combat (Horowitz, 1975; Horowitz, 1982; Joseph, Williams & Yule, 1997). This research, along with work by activists on behalf of undiagnosed traumatised war veterans, led to the inclusion of PTSD in the DSM 3rd Edition (DSM-III) in 1980 (Andreasen, 2010; Lasiuk & Hegadoren, 2006; Scott, 1990; Young, 1997; see Table 2.1 for criteria list). While revision to the definition and diagnostic criteria of PTSD was made in future editions of DSM, it still retains the core features of DSM-III. DSM-III provided the first official classification of a mental disorder characterised by intrusive flashbacks, detachment from the world, and distortedly high arousal, caused by stressful external environmental events (Friedman, 2013; Lasiuk & Hegadoren, 2006). Furthermore, DSM-III stated that PTSD, unlike traumatic neurosis from Kardiner's interpretation (1941), could be caused by non-military stressful events in civilians, as long as the experience was considered to be 'outside the usual range of human experience' (Lasiuk & Hegadoren, 2006). This led to studies suggesting that rates of PTSD were greater in sexually abused children (Wolfe, Gentile, & Wolfe, 1989), Holocaust survivors (Kuch & Cox, 1992), clinical staff who were victims of patient violence (Caldwell, 1992), and police officers involved in shooting incidents (Gersons, 1989).

Table 2.1

DSM-III Criteria for PTSD

-
- | | |
|-----|--|
| 1. | The existence of a recognisable stressor that would evoke significant symptoms of distress in almost anyone. |
| 2. | Re-experiencing of the trauma as evidenced by at least one of the following: |
| (a) | Recurrent and intrusive recollections of the event |
| (b) | Recurrent dreams of the event. |

- (c) Sudden acting or feeling as if the traumatic event were re-occurring, because of an association with an environment of ideational stimulus.
5
3. Numbing of responsiveness to or reduced involvement with the external world, beginning some time after the trauma, as shown by at least one of the following:
- (a) Markedly diminished interest in one or more significant activities.
 - (b) Feeling detached or estrangement from others.
 - (c) Constricted affect.
4. At least two of the following symptoms that were not present before the trauma:
- (a) Hyperalertness or exaggerated startled response.
 - (b) Sleep disturbances.
 - (c) Guilt about surviving when others have not, or about behaviour required for survival.
 - (d) Memory impairment or trouble concentrating.
 - (e) Avoidance or activities that arouse recollection of the traumatic event.
 - (f) Intensification of symptoms by exposure to events that symbolize or resemble the traumatic event.
-

Note. Reproduced from Cantor (2005).

However, during the 1980s there were no studies linking PTSD to paramedics. There were studies linking the nature of a paramedics' work to other stress-related mental distress such as burnout (Grigsby & Knew, 1988; Murphy, Beaton, Pike, & Cain, 1994), occupational stress (Cydulka et al., 1989; Hammer, Mathews, Lyons, & Johnson, 1986) and physiological effects of stress (Jamner, Shapiro, Goldstein, & Hug, 1991; Goldstein, Jamner, & Shapiro, 1992). In 1994, the release of DSM-IV provided several affecting changes to the diagnosis of PTSD (APA, 1994). The most notable change was to Criterion A, regarding the traumatic experience. While DSM-III required this to be outside the usual range of human experience, DSM-IV allowed for stressful

experiences that were not necessarily outside the ‘usual range’ (Joseph, Williams & Yule, 1997). This could therefore account for bystanders and witnesses of traumatic incidents, rather than the victims directly involved (McNally, 2004). Reinforcing this point, research focusing on psychotherapy in the 1990s began to introduce the notion of vicarious traumatisation, resulting from listening to patients’ traumatic stories, often resulting in symptomology akin to bystander trauma (Courtois, 1993; McCann & Pearlman, 1990; Lansen, 1993). Rather than the traumatic event itself, more emphasis was placed on the victim’s response to the traumatic event; the criteria required a response involving fear, helplessness or horror (Joseph, Williams & Yule, 1997). Thus, the inclusion criteria for PTSD was expanded in DSM-IV (McNally, 2009; see Table 2.2 for criteria list).

2.5 DSM-IV: The Key to PTSD Research in Paramedics?

Since DSM-IV redefined PTSD in 1994, the research suggesting that PTSD was more prevalent in paramedics compared to the general population increased (Bennett, Williams, Page, Hood & Woollard, 2004; Grevin, 1996; Larkin, Frame & Morrison, 2000; Mitchell & Dyregrov, 1993). Research also explored predictor variables of PTSD onset in paramedics (Wild et al., 2016), coping strategies (Kirby, Shakespeare-Finch, & Palk, 2011; Mildenhall, 2012a; Ogińska-Bulik & Kobylarczyk, 2015), underlying causes (Fjeldheim et al., 2014; Lowery & Stokes, 2005; Rybojad, Aftyka, Baran & Rzońca, 2016) and treatments (Dodd, 2017; Porter & Johnson, 2008; Scully, 2011). From this we can ask: Did the alternation of the definition of PTSD in DSM-IV directly lead to the influx of research on PTSD in paramedics, or were other factors involved?

There are a number of scholars who advocate that the lowered threshold of DSM-IV for PTSD diagnosis led to increases in PTSD diagnosis across many population groups as well as paramedics. McNally (2004) argues that the change to

Criterion A in DSM-IV has led to an over-diagnosis of PTSD in populations that have not experienced ‘catastrophic events falling outside the perimeter of everyday experience’. Other scholars argue that the vague and inclusive definition of PTSD in DSM-IV has increased its diagnosis across a variety of populations (Andreasen, 2010; Spitzer, First & Wakefield, 2007). Populations listed by these scholars include Americans who watched television coverage of the September 11 2001 terrorist attack, victim of sexual harassment in the workplace, and surgical patients. It may therefore be possible that PTSD diagnosis in paramedics became possible only after the “conceptual bracket creep in the definition of trauma” (McNally, 2004, p. 3) created by DSM-IV.

This idea is reinforced by the information and background chapter for self-help manual for stress in emergency workers published by Hartsough, Myers and Garaventa (1985). Their manual states that common issues after event stressors include anxiety, fatigue, depression and irritability. However, the manual advocates that an extreme form of this symptomology is required for PTSD to be considered. They further argue that this symptomology is natural and expected in emergency workers, rather than ‘a disorder’.

“Readers should be cautioned against the frequent or premature use of PTSD as a label. People who have been involved in disasters may experience several of the disturbances noted above without meeting the specific criteria for PTSD as described in DSM-III. Only well-trained mental health clinicians are qualified to make such a diagnosis.” (Hartsough, Myers & Garaventa, 1985; p. 31)

“It is important to note here that, just as with disaster victims, the emergence of disturbing and sometimes dramatic emotional problems in workers is a natural result of the obliteration of normality that disasters represent. Disaster workers who experience these problems should not be viewed or dealt with as if they suffered from mental illness. They are responding normally to very abnormal situations.” (Hartsough, Myers & Garaventa, 1985; p. 35)

Therefore, this may suggest that the trauma experienced by paramedics may meet the criteria for PTSD in DSM-IV but does not meet the criteria in DSM-III. This could be attributed to DSM-IV allowing for experiences ‘within the range of usual human experience’ and for accounting for non-direct victims of the traumatic event, such as the paramedics who arrive to handle the aftermath of the scene (McNally, 2004).

On the other hand, it can be argued that the severity and prevalence of PTSD in paramedics is such that it had the potential to have been diagnosed using DSM-III during the 1980s. While published in 1999, the study by Clohessy and Ehlers found that 21% of paramedics in their study met the criteria for PTSD using DSM-III. Additionally, recent studies are suggesting that the rates of PTSD in paramedics are equal, if not greater, to that of military soldiers. Recent studies report PTSD in around 10% of paramedics (Shepherd & Wild, 2014) and in around 3-5% of UK military soldiers (Fear et al., 2010) (it should however be noted that while there are comparisons of *rates* of PTSD diagnosis between paramedics and military soldiers, there are no studies comparing the *severity* of PTSD between these two populations. Such a study may prove to be important within the current topic). Therefore, it is likely that PTSD was diagnosable using DSM-III criteria between 1980 and 1993, and there are potentially other factors involved that restricted studies on PTSD in paramedics being carried out in this period. These may include a culture of masculinity within the paramedic workforce, emphasising toughness and reticence to disclose vulnerabilities (Pucci, 2017; Quaile, 2016). This may have caused an under-reporting of mental health issues. Also, most of the research on PTSD during that period was more focused on the direct victims of traumatic events rather non-direct victims (McNally, 2004).

Additionally, the increase in studies investigating PTSD in paramedics after 1994 can potentially be explained by a wider cultural shift in the perception of what

mental distress in paramedics is. As mentioned above, Hartsough, Myers and Garaventa stated in their 1985 report that paramedics were responding “normally to very abnormal situations” (Hartsough, Myers & Garaventa, 1985, p. 42) and were therefore not suffering from defined mental illness. Most modern researchers in this field now argue that psychological distress inflicted on paramedics by critical incidents at work is not a ‘normal’ response, and they are in fact victims who are in need of support and treatment (Crampton, 2012; Pucci, 2017; Regehr, Goldberg & Hughes, 2002). Thus, the change in approach towards mental distress and mental disorders in paramedics also explains the increased research since 1994.

Table 2.2

DSM-IV Criteria for PTSD

- A. The person has been exposed to a traumatic event in which both the following were present:
- (1) The person experienced, witnessed, or was confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others.
 - (2) The person’s response involved fear, helplessness, or horror. *Note:* In children, this may be expressed instead by disorganised or agitated behaviour.
- B. The traumatic event is persistently re-experienced in one (or more) of the following ways:
- (1) Recurrent and intrusive distressing recollections of the event, including images, thoughts, or perceptions. *Note:* In young children, repetitive play may occur in which themes or aspects of the trauma are expressed.
 - (2) Recurrent distressing dreams of the event. *Note:* In children, there may be frightening dreams without recognisable content.
 - (3) Acting or feeling as if the traumatic event were recurring (includes a sense of reliving the experience, illusions, hallucinations, and dissociative flashback episodes, including those that occur on awakening or when intoxicated).
 - (4) Intense psychological distress at exposure to internal or external cues that symbolise or resemble an aspect of the traumatic event.
 - (5) Physiological or reactivity on exposure to internal or external cues that symbolise or resemble an aspect of the traumatic event.

- C. Persistent avoidance of stimuli associated with the trauma and numbing of general responsiveness (not present before the trauma), as indicated by three (or more) of the following:
- (1) Efforts to avoid thoughts, feelings, or conversations associated with the trauma.
 - (2) Efforts to avoid activities, places, or people that arouse recollection of the trauma.
 - (3) Inability to recall an important aspect of the trauma.
 - (4) Markedly diminished interest or participation in significant events.
 - (5) Feeling of detachment or estrangement from others.
 - (6) Restricted range of affect (e.g., unable to have loving feelings).
 - (7) Sense of foreshortened future (e.g. does not expect to have a career, marriage, children, or a normal life span).
- D. Persistent symptoms of increased arousal (not present before the trauma) as indicated by two (or more) of the following:
- (1) Difficulty falling or staying asleep.
 - (2) Irritability or outbursts of anger.
 - (3) Difficulty concentrating.
 - (4) Hypervigilance.
 - (5) Exaggerated startled response.
- E. Duration of the disturbance (symptoms in criteria B, C and D) is more than one month.
- F. The disturbance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning.

Specify if:

Acute: if duration of symptoms is less than three months.

Chronic: if duration of symptoms is three months or more.

Specify if: *With delayed onset:* if onset of symptoms is at least six months after the stressor.

Note. Reproduced from Cantor (2005).

2.6 Chronic Stress Disorders: The Missing Link in Paramedics and PTSD?

The research highlighting the issue of trauma and PTSD in paramedics has therefore arisen from both cultural shifts towards our perception of mental distress, and the change in PTSD criteria in DSM-IV. Despite the apparent importance of DSM-IV in paving the way for PTSD research in paramedics, the diagnostic criteria in DSM-IV is

not without its issues and problems (McNally, 2004; McNally, 2009; Spitzer, First & Wakefield, 2007). These include vagueness and overuse due to the “conceptual bracket creep” (McNally, 2004, p. 3). Furthermore, DSM-IV was unclear regarding the inclusion of PTSD caused by chronic traumatic experiences. Criterion A (1) states “The person experienced, witnessed, or was confronted with an event, **or events**, that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others” (APA, 1994, p. 427). The pluralisation of ‘events’ does not provide a specific enough confirmation that the criterion includes PTSD caused by repeated exposure to traumatic stimuli.

The research literature presented here suggests that repeated exposure to traumatic stimuli leads to variations of PTSD. Lanius et al. (2010) reports that repeated stresses such as chronic childhood abuse and combat trauma can result in a dissociative subtype of PTSD that is more characterised by affective symptomology. Affective symptomology refers to mental distress that is characterised more by lower self-esteem, impairments in social adjustment, and negative mood patterns (Serretti et al., 1999). Cloitre et al. (2013) provides evidence for a subtype of PTSD caused by repeated exposure to traumatic stressors; this is referred to as complex PTSD (CPTSD) in their definition³. A standardised classification of PTSD based on repeated interaction with traumatic stimuli is important for paramedics because their profession is characterised by the accumulation of stressful work events as much as it is characterised by acute traumatic work incidents (Alexander & Klein, 2001; UNISON, 2013). Thus, the ability to diagnose a dissociative subtype of PTSD in this population may help produce effective treatments to alleviate this issue efficiently.

³ It should be noted that variations within defined psychiatric categories is not unusual, as some advocate for more continuum-based definitions of mental distress.

Research has investigated the effects of chronic traumatisation on paramedics. Arguably however, there are several criticisms of this research. As mentioned above, there was no official, clear category for such a disorder in DSM-IV (APA, 1994). This has resulted in the use of a wide range of non-standardised terminology with non-specified intensity of symptoms when researching such chronic stress mental distress. Unlike the unity of acute-stress disorders created by the criteria for PTSD in DSM-III (Blake, Albano & Keane, 1992; Joseph, Williams & Yule, 1997), neither DSM-III nor DSM-IV accomplished this for PTSD caused by cumulative stress. Thus, there are separate bodies of work linking paramedics to burnout (Grigsby & Knew, 1988; Nirel et al., 2008), compassion fatigue (Figley, 2013; Inbar & Ganor, 2003), and chronic workplace stress (Halpern & Maunder, 2011). None of these mental distresses were listed under DSM-IV (APA, 1994). Hence, they are referred to as ‘mental distress’ rather than ‘mental disorders’, with the latter being named so based on inclusion in a diagnostic system. Thus, some form of classification based on chronic exposure to critical incidents and affective symptoms may assist with furthering our understanding of the complete aetiology of PTSD.

2.7 DSM-5: A Bridge to PTSD Caused by Repetitive Exposure to Trauma?

In 2013, the criteria for PTSD was further altered in DSM-5 (APA, 2013; see Table 2.3 for criteria list). Following criticism that DSM-IV had become too inclusive (McNally, 2004; McNally, 2009; Spitzer, First & Wakefield, 2007), DSM-5 aimed for a more conservative, restrictive diagnostic criteria for PTSD (Pai, Suris & North, 2017). This is reflected by the change in Criterion A, which now requires ‘actual or threatened death, serious injury or sexual violence’ and no longer requires the victim’s subjective response of ‘fear, helplessness or horror’ (APA, 2013; Joseph, Williams & Yule, 1997; Pai, Suris & North, 2017). Thus, Criterion A is now more based on the traumatic event, rather than the person’s response to it.

It has been suggested that the updated, restrictive criteria have made the diagnosis of PTSD less inclusive. Kilpatrick et al. (2013) recruited participants from the general population using an online survey, and found that 60% of cases who met the DSM-IV criteria for PTSD did not meet the criteria in DSM-5. It is likely that diagnosis of PTSD in paramedics will be changed little by DSM-5. The nature of their profession means that they are often exposed and witnesses to death and serious injury (APA, 2013; Pucci, 2017). Nevertheless, studies investigating PTSD in paramedics using DSM-5 need to be conducted to investigate this. So far, no studies on this issue published after 2013 have used the criteria of DSM-5, and have mostly continued to use DSM-IV (Fjeldheim et al., 2014; Michael, Streb & Hällner, 2016; Oravec, Penko, Suklan & Krivec, 2018). However, while these studies were published after 2013, it is likely that most of these studies began before DSM-5 was published in 2013, and thus used the DSM-IV criteria.

Importantly, DSM-5 has included criteria for the dissociative subtype of PTSD proposed by Lanius et al (2010). Firstly, Criterion A has listed a fourth exposure type: “Repeated or extreme exposure to aversive details of a traumatic event, which applies to workers who encounter the consequences of traumatic events as part of their professional responsibilities (e.g., military mortuary workers, forensic child abuse investigators).” (APA, 2013; Pai, Suris & North, p. 3). This addition to the criteria has therefore made it more feasible to diagnose paramedics with PTSD based on their repeated traumatic experiences in their work. Future research using DSM-5 may therefore be likely to diagnose paramedics with PTSD as described in Lanius et al. (2010) rather than other forms of chronic mental distress not listed in DSM such as burnout or workplace stress.

As well as the exposure to trauma, DSM-5 has updated the symptomology to include negative affective symptoms associated with PTSD caused by repeated

exposure to stressful stimuli (Chu, 2010; Lanius et al., 2010). PTSD is no longer associated entirely with anxiety, and is now located in a new category under ‘trauma and stress-related disorders’ (APA, 2013; Succi, 2017). This is due to research suggesting that anxiety is not always specific to PTSD (Spitzer, First & Wakefield, 2007; Succi, 2017). DSM-5 has therefore placed an increased emphasis on negative affective symptoms. DSM-5 has added a new criterion (Criterion D) that requires at least two affective symptoms (see Table 2.3). The diagnostic criteria for PTSD now include negative affective symptomology of PTSD, caused primarily by repeated exposure to traumatic work events over time, akin to the dissociative subtype of PTSD described by Lanius et al (2010). Thus, paramedics who in the past may have been identified with a chronic mental distress not listed under DSM such as burnout or work stress may be more likely to receive a diagnosis of PTSD through the negative affective symptoms listed under Criterion D.

Table 2.3

DSM-5 Criteria for PTSD

A: stressor	The person was exposed to: death, threatened death, actual or threatened serious injury, or actual or threatened sexual violence, as follows: (1 required)
(1)	Direct exposure
(2)	Witnessing, in person
(3)	Indirectly, by learning that a close relative or close friend was exposed to trauma. If the event involved actual or threatened death, it must have been violent or accidental.
(4)	Repeated or extreme indirect exposure to aversive details of the event(s), usually in the course of professional duties (e.g. first responders, collecting body parts; professionals repeatedly exposed to details of child abuse). This does not include indirect non-professional exposure through electronic media, television, movies, or pictures.
B: intrusion symptoms	The traumatic event is persistently re-experienced in the following way(s): (1 required)

- (1) Recurrent and, involuntary, and intrusive memories. *Note:* Children older than 6 may express this symptom in repetitive play.
 - (2) Traumatic nightmares. *Note:* Children may have frightening dreams without content related to the trauma(s).
 - (3) Dissociative reactions (e.g., flashbacks) which may occur on a continuum from brief episodes to complete loss of consciousness. *Note:* Children may re-enact the event in play.
 - (4) Intense or prolonged distress after exposure to traumatic reminders.
 - (5) Marked physiological reactivity after exposure to trauma-related stimuli.
- C: avoidance Persistent effortful avoidance of distressing trauma-related stimuli after the event: **(1 required)**
- (1) Trauma-related thoughts or feelings.
 - (2) Trauma-related external reminders (e.g., people, places, conversations, activities, objects, or situations).
- D: negative alterations in cognitions and mood Negative alterations in cognitions and mood that began or worsened after the traumatic event: **(2 required)**
- (1) Inability to recall key features of the traumatic event (usually dissociative amnesia; not due to head injury, alcohol or drugs).
 - (2) Persistent (and often distorted) negative beliefs and expectations about oneself or the world (e.g., “I am bad,” “The world is completely dangerous.”).
 - (3) Persistent distorted blame of self for others causing the traumatic event or for resulting consequences.
 - (4) Persistent negative trauma-related emotions (e.g., fear, horror, anger, guilt or shame).
 - (5) Markedly diminished interest in (pre-traumatic) significant activities.
 - (6) Feeling alienated from others (e.g., detachment or estrangement).
 - (7) Constricted affect: persistent inability to experience positive emotions.
- E: alterations in arousal and reactivity Trauma-related alterations in arousal and reactivity that began or worsened after the traumatic event: **(2 required)**
- (1) Irritable or aggressive behaviour.
 - (2) Self-destructive or reckless behaviour.
 - (3) Hypervigilance.
 - (4) Exaggerated startled response.
 - (5) Problems in concentration.
 - (6) Sleep disturbance.
- F: duration Persistence of symptoms (in Criteria B, C, D and E) for more than one month.

G: functional significance Significant symptom-related distress or functional impairment (e.g., social, occupational).

H: attribution Disturbance is not due to medication, substance use, or other illness.

Specify if: With dissociative symptoms.

In addition to meeting criteria for diagnosis, an individual experiences high levels of either of the following in reaction to trauma-related stimuli:

1. Depersonalization: experience of being an outside observer of or detached from oneself (e.g. feeling as if “this is not happening to me” or one were in a dream).
2. Derealisation: experience of unreality, distance, or distortion (e.g., “things are not real”).

Specify if: With delayed expression.
Full diagnosis is not met until at least 6 months after the trauma(s), although onset of symptoms may occur immediately.

Note. Reproduced from Stoddard, Benedek, Milad & Ursano (2018).

2.8 ICD-11 and Complex PTSD: An Alternate Approach

For the past 30 years, both DSM and the ICD have mostly agreed with the definition and categorisation of PTSD (Peters et al., 1999). However, the agreement between the two manuals has altered over the past eight years. While DSM-5 in 2013 made PTSD more inclusive for negative symptoms caused by chronic exposure to critical incidents at work, ICD-11 argues that there are two sibling disorders that each covers acute trauma and chronic trauma (see Table 2.4 for criteria list). Separately, ICD-11 still retains a definition of PTSD characterised by acute critical incidents resulting in symptoms characterised by hyperarousal. It also defined the sibling disorder, CPTSD, as being more characterised by negative affective symptoms. To clarify, negative affective symptoms represent a constellation of PTSD symptoms that are more associated with a reduction in apparent activity such as avoidance, emotional numbing, self-blame or

reduced sociability (Brown et al., 2016; Kashdan, Elhai & Frueh, 2007). They are often caused by chronic trauma over time, such as childhood abuse, and often occurs in comorbidity with other disorders such as depression (Cloitre et al., 2013; WHO 2018).

Table 2.4

ICD-11 Criteria for PTSD and Complex PTSD

Symptom Cluster	Symptom	PTSD	Complex PTSD
Re-experiencing	Intrusive flashbacks, vivid memories or reoccurring dreams. Experiencing distress when reminded of the stressor.	At least one symptom.	At least one symptom.
Avoidance	Internal avoidance External Avoidance	At least one symptom	At least one symptom
Hyperarousal	Inability to recall Sleep problems Irritability Concentration problems Hypervigilance Exaggerated startled response	At least one symptom	At least one symptom
Affect dysregulation			At least one symptom
Negative self-concept			At least one symptom
Interpersonal problems			At least one symptom

Note. Reproduced from Knefel and Lueger-Schuster (2013).

Despite being formally recognised in ICD-11 in 2018, the idea for a separate term of CPTSD has existed since the early 1990s (Herman, 1992; Roth et al., 1997; Van der Kolk, 2002). A number of researchers argued for the inclusion of CPTSD in ICD-11 based on the overall literature (Maercker et al., 2013). Prior to 2018, further analytical evidence was provided to suggest that PTSD could be split into two sibling disorders.

Latent profile analysis by Cloitre et al. (2013) suggested a distinction between hyperarousal PTSD symptoms and affective PTSD symptoms, with single-event trauma being more predictive of PTSD and chronic trauma being more predictive of CPTSD.

At the present, it is too early to provide a conclusion on the validity on either DSM-5 or ICD-11 criteria for PTSD. Research so far is rather inconclusive, with mixed findings for the validity of both DSM-5 (Stein et al., 2014; Hansen et al., 2015) and ICD-11 (Hansen et al., 2015; Wolf et al. 2015). The validity of PTSD has been subject to a controversial debate since its inception in DSM-III; the corollary debate surrounding the difference between DSM-5 and ICD-11 is not likely to be resolved quickly.

2.9 PTSD: A Real Disorder, or a Modern Invention?

So far, I have provided an outline for the history of trauma and PTSD diagnosis, and how this has progressed from soldiers in the First World War to intersect with the current topic of paramedics' experiences. It is also important to reflect back on the section above and ask if PTSD is a *real* psychological disorder, or a Western socio-cultural psychiatric invention? This is a question that philosophers, psychologists and psychiatrists have also been asking throughout this period with regards to both PTSD and mental illness in general.

There are essentially three schools of thought in this area. The first states that PTSD is a real disorder of the mind. PTSD possesses a distinct aetiology with the potential to affect any given individual. The second states that while there does exist a form of mental illness caused by intense stress, it is diagnosed, measured and treated using methods created under a historically contingent set of psychiatric-psychological practices. Therefore, the way in which psychologists have imposed their culture on the issue of PTSD affects its validity. The third view states that PTSD has no aetiological

basis or physical entity, and is fabricated almost exclusively from socio-political ideas and practices framed by the cultural conditions of late modernity, within an overarching, and contestable aetiology. Each view is discussed below.

2.9.1 View 1: Evidence for PTSD.

A frequent critique of mental illness is that it is really just extreme variants of personality or ‘deviant’ behaviour that society has labelled as ‘mental illness’ (Szasz, 1974). It can be argued PTSD itself counters this argument, as the symptomology does not present itself as an extreme end of personality. Instead, the disorder has a given origin point, in that the trauma provides a marker as to when the subject’s personality changed. For instance, the subject may be notably less sociable after a car crash (Maes, Mylle, Delmeire, & Janca, 2001). PTSD is also marked by symptoms such as alteration in memory functioning (Jelinek et al., 2006), hyperarousal (Kendall-Tackett, 2000), and insomnia (Maher, Rego & Asnis, 2006). Thus, these non-personality based symptomology suggests that PTSD is by no means a personality extreme that has been deemed as ‘psychopathology’ by society or psychiatry.

Additionally, neuroimaging studies suggest that PTSD does possess a biological aetiology. These studies have found abnormal activity in the hippocampus, amygdala, and the medial frontal cortex (Nutt & Malizia, 2004). For instance, the amygdala appears to be particularly hyperactive when processing trauma-related information and stimuli (Ursano et al., 2009). Therefore, it is hypothesised that PTSD symptoms, such as discomfoting flashbacks, may be due to the inability of higher brain regions to regulate memory and responses (Ursano et al., 2009). Neuroimaging studies are not completely conclusive, and are often criticised for being reflective rather than predictive (Logothetis, 2008; Poldrack, 2009). Nevertheless, evidence for the biological basis of PTSD does provide support for its validity.

Furthermore, documented evidence from before the 20th Century suggests that PTSD symptoms existed in certain individuals despite the absence of a clinical classification. Although the disorder was not a classified condition prior to 1980, nor studied at a psychological level prior to Kardiner (1941), evidence seems to suggest that individuals did exhibit PTSD in the aftermath of stressful events, such as natural disasters, industrial accidents and war. Parry-Jones and Parry-Jones (1994) provide an account of a peasant family who were victims of an avalanche in 1755. The documented experiences from those involved seem to suggest that they experienced symptoms resembling PTSD. A similar documentation of possible PTSD prior to the 1900s can be found in autobiographical notes by Charles Dickens. One year after he was involved in a railway accident that injured and killed other passengers, he wrote about having ‘a sudden vague rush of terror’ when riding on other trains (Beveridge, 1997; Cantor, 2005). Examples such as these suggest that acute PTSD existed as a psychological phenomenon prior to application of clinical criteria and diagnosis.

As well as acute PTSD, anecdotal evidence suggests that chronic PTSD was also present before the 20th Century. A potential example can be seen with Charles Bell; a military surgeon during the Revolutionary and Napoleonic Wars between 1792 and 1815 (Crumplin & Starling, 2005). As well as performing surgery on soldiers, he was also a skilled artist who provided vivid drawings of war injuries during his time in surgery. These secondary traumatic experiences appeared to have still affected him six months after the war. Reportedly, he was drained and obtained a “gloomy, uncomfortable view of human nature” due to witnessing “the most shocking sights... expressions of the dying and noisome smells”, as well as being “easily moved, easily distempered and cast down” (Stanley, 2003, p. 120). The case of Charles Bell further provides evidence that PTSD, in its chronic form, existed prior to the 20th Century, and is not a concept ‘invented’ over the past one-hundred years.

2.9.2 View 2: Modern Western Bias and Influence over PTSD Classification.

The second historical view of PTSD argues that while a psychological disorder that is caused by extreme stress does exist, the way in which psychologists in predominantly Western nations such as North America and Europe study, classify and treat it does overall influence its apparent aetiology. Young (1997) particularly advocates this view. Based on his research on a diagnosis and assessment unit at an inpatient ward for war veterans, he argues that traumatic memory is a wide-spanning disorder that is shaped by experiences, convictions, and personal cognitions. He further argues that psychological research since the Second World War has essentially invented a rigid, 'one size fits all' model formed by Western cultural practices, technologies and narratives. He further states that this has also been imposed upon by various interests, institutions and moral arguments. Thus, according to Young's views, this has influenced how the labelled disorder has been diagnosed, studied and treated. For example, Young (1997) states that a feature of PTSD is that intrusive memories cause patients to relive past memories in the present. When researchers, psychologists and psychiatrists interviewed and diagnosed Vietnam War veterans, they tended to influence them into recollecting their traumatic past memories, thus influencing the probability of a PTSD diagnosis.

A similar argument can be made by evolutionary perspectives of PTSD. Cantor (2005) argues that PTSD is not necessarily a disorder of brain functioning, but an evolved response to danger in order to help prevent both humans and animals returning to places and situations of danger. This theory is further supported by neuroimaging evidence suggesting that PTSD involves impairments in neomammalian areas of the brain, as opposed to paleomammalian and reptilian areas (Ursano et al., 2009). Thus, Cantor argues that both the structure of modern society and modern psychiatry has

resulted in trauma-responsive behaviours, which were once useful to human survival, being labelled as a psychiatric disorder.

Furthermore, cultural differences in responses to trauma supports the notion that PTSD is made of parameters set by predominantly Western cultures. Various studies show that different ethnic groups respond in different ways to trauma and treatment for PTSD (Perilla, Norris & Lavizzo, 2002; Marsella, Friedman & Spain, 1996; Wilson, 2007). While clinicians largely work in a mental health care system influenced by Western ideas, other cultures have different mediating systems such as religion, practices and different types of support systems (De Jong, 2004). This supports the idea that PTSD does not have a fixed aetiology that can be measured and treated the same way across all humans.

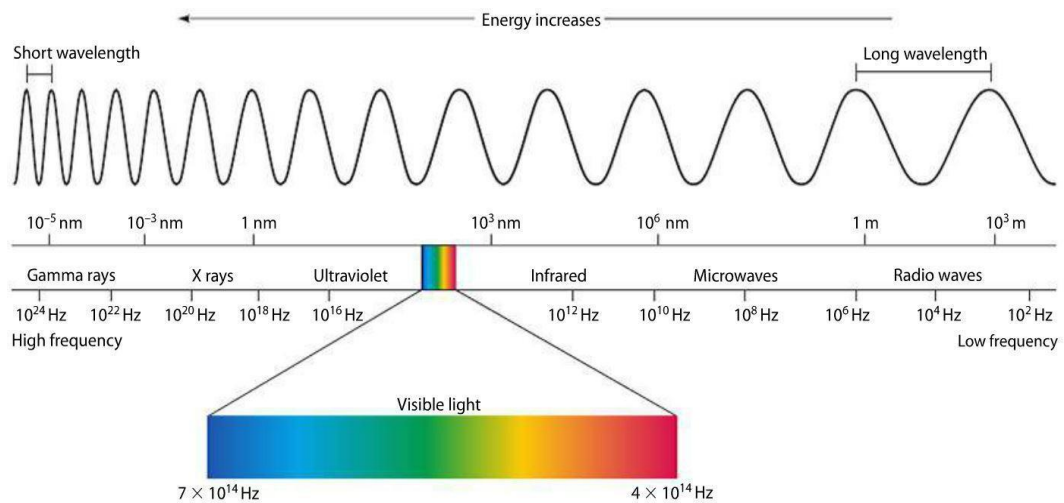
This second view on the origins of PTSD diagnosis makes some important points about how the ability to diagnose PTSD was dependent on the ideas that humans have imposed upon it, rather than purely measuring something with an untarnished aetiology in nature. I however argue that all science, to one extent or another, requires humans to impose upon it in some way to help make sense of the world. To take an example from physics, we can observe the diagram of the electromagnetic spectrum (see Figure 2.1).

The diagram presents a continuous spectrum of increasing frequency and decreasing wavelength. At certain points, cut-offs are made to categorise different parts with labels to represent radio waves, microwaves etc. These categories however are not an entity of nature. These categories were imposed by physicists in order to explain different properties within the spectrum. While the choice as to where the cut-off points are is not influenced by *cultural* ideas, they are however influenced by *human* ideas. Visible light helps us to see, so we cut this off from infra-red and ultraviolet, which are

both invisible to the naked eye. We make cut-off points between x-rays, which help us to see bones through skin, and gamma rays, which are dangerous when exposed to humans. Yet in nature, these cut-off points do not exist. Nature presents electromagnetic radiation as a continuous variable with no categorically separate points. For all nature is concerned, these cut-off points could be made at any other point along the spectrum. If, for instance, bees somehow became intelligent enough to create laws explaining electromagnetic waves, it is likely they would have different cut-off points to conform with the fact that their visual spectrum includes ultraviolet light, but not red light (Riddle, 2016).

Figure 2.1

A diagram of the electromagnetic spectrum



Note. Diagram reproduced from miniphysics.com.

Therefore, a similar point can be made about human-made criteria for mental illness. While the categories we impose on mental and behavioural abnormality are human and culture-based impositions that ultimately do not exist in nature, they are often the best we can do to help understand, explain and treat mental illness. While the recorded aetiology of PTSD has been imposed upon by cultural and circumstantial

influences, it does not necessarily hamper the validity of PTSD. Indeed, some of the persuasive critique of psychiatric definitions of mental illness is concerned with the imposition of inflexible categories, rather than a denial of the existence of extreme forms of mental disorders. These critics argue for continuum-based models of human experience rather than psychiatric taxonomies. These critics also advocate for alternative forms of prevention, treatment and support that emphasises holistic, psychosocial factors rather than biological factors. However, they do not deny all aspects of biology and neuroscience (see Johnstone & Boyle, 2018).

2.9.3 View 3: *Is PTSD an Invention?*

The third view is that PTSD is almost entirely a human fabrication with no real aetiology in nature. A predominant figure in the idea that mental illnesses are fabrication to control difficult and different members of society is Thomas Szasz (1974). In his work, he provides accounts for his view that ‘mental illness’ is an invented metaphor, and is used to label extreme personality attributes and behaviours society deems as dislikeable. His arguments do present interesting ideas with regards to some other classified mental disorders, particularly in the case of homosexuality, which was deemed as a mental disorder in DSM up until 1987 (he et al., 1997). However, as mentioned earlier in this chapter, PTSD does not present itself as an extreme variation of personality (Raskind et al., 2003). Additionally, the physiological components of PTSD, which were the first symptoms recognised by late 19th and early 20th century doctors such as Myers (1870) and Meyers (1915), are an elemental feature of PTSD (Butler et al., 1990). Therefore, it is unlikely that PTSD corresponds to Meyers’ ideas about the invention of mental illness.

A more extreme view is that PTSD is a fabricated disorder used to influence social and political policies. Brewin (2003) provides accounts from an array of these

views, as well as his own. Advocates of this view argue that overcoming trauma with time is a natural part of life, and it is not a disorder that requires labelling. Critics such as Lembcke (1998) argue that PTSD was constructed during the Vietnam War in order to help repair the negative images of the war from the American perspective, and allow their soldiers to be portrayed as the victims rather than the aggressors. He further argues that this also helped to divert attention away from the politicians who promoted the war. Supposedly, this also allowed other groups of traumatised individuals to promote the recognition of their hidden suffering, such as victims of rape and domestic violence.

It is unlikely that this view carries complete truth due to the large body of evidence that PTSD, in some form or another, possesses a biological and psychological aetiology. It also presents in the actual traumatised experiences of individuals (however we care to define these), necessitating some sort of humane and compassionate response at individual and service levels. As mentioned in Section 2.9.1, historical evidence suggests that PTSD, both chronic and acute, existed prior to official diagnoses and interest in research. Additionally, neuroimaging and physiological studies suggests that PTSD has a biological basis that can further quantify and measure the disorder. Furthermore, the large body of research into diagnosing and treating PTSD in a variety of populations in itself supports the validity of PTSD. That the presence of PTSD as a category of human experience may indeed become a vehicle for other social, political and cultural functions need not negate concern for real human suffering experienced by groups and individuals.

2.10 How Successful are Medical Models of PTSD?

While there are various approaches to conceptualising PTSD, medical models are perhaps the most influential (Jakovljević et al., 2012). Starting with the inclusion of PTSD in DSM-III, PTSD continues to be largely viewed as a disease with neurological

underpinnings resulting in cognitive and behavioural deficits (Jakovljević et al., 2012) despite the conceptual issues listed above. Therefore, it is important to ask how successful medical models of PTSD have been in formulating treatments aimed at alleviating symptoms in those diagnosed with PTSD.

Pharmaceutical treatments have been used in the treatment of PTSD. Following the medical model, the medications prescribed to those with PTSD aims to help reverse the neurological abnormalities associated with biological theories of PTSD (Jakovljević et al., 2012). Prior to 2018, selective serotonin re-uptake inhibitors (SSRIs) such as sertraline and paroxetine were more typically used, while benzodiazepines and mood-stabilisers were sometimes used when hyperarousal symptoms were troubling the individual the most (Foa, Davidson & Frances, 1999; Ipser, Seedat & Stein, 2006; Marshall et al., 2001; Stein et al., 2006). A systematic review and meta-analysis by Ipser, Seedat and Stein (2006) found that of the 35 trials included, a significant improvement in symptoms was found for 17 trials. Improvement was made in a wide range of PTSD symptoms such as re-experiencing, numbing, avoidance and hyperarousal, and co-morbid symptoms such as depression.

However, if pharmaceutical medication alone worked in treating PTSD, then the meta-analysis by Ipser, Seedat and Stein (2006) would have found significant improvements compared to the placebo in all of the trials rather than 17 out of 35. In 2018, the treatment of PTSD in the UK was updated by the NICE Guidelines (2018). The new guidelines state that there is not enough consistent evidence that any drug treatments are effective in preventing PTSD, and there are also potentially harmful side effects. Therefore, the 2018 NICE Guidelines now state that drug treatments should not be offered to adults with PTSD. If the individual diagnosed with PTSD requests drug

therapy, then venlafaxine, an SSRI or antipsychotics for hyperarousal symptoms.

Benzodiazepines are specifically discouraged by the 2018 NICE Guidelines.

Therefore, it appears that other factors are involved in the recovery of patients such as the relationship with the figure administering them (Timimi, 2014) and the patients' attitude towards recovery (Bracken et al., 2012). Some experts in this field state that psychiatric drugs should be used as temporary aids while more psychological medical model treatments should be used to help improve cognitive functioning (Moncrieff & Cohen, 2009). This point is reinforced by a meta-analysis by Jonas et al. (2013) who found greater effect sizes for psychological therapies in PTSD treatment, such as CBT and eye movement desensitisation and reprocessing (EMDR) compared to pharmaceutical treatment. Psychological therapies displayed a reduction in the clinician administered PTSD scale (CAPS), with an effect size ranging from 28.9 to 32.2, between the experimental condition and control condition. Pharmaceutical treatments showed a reduction in CAPS with an effect size from 4.9 to 15.5 between the drug treatment group and the placebo treatment group.

There are also growing criticisms that the medical model of psychiatry and PTSD are flawed, and that alternate approaches may be more suitable. Criticisms have been made based on research suggesting that improvement in depression-related disorders comes more from the non-technical aspect of interventions such as a positive relationship with the practitioner that provides a sense of meaning and hope rather than the medical model-based therapy itself (Bracken et al., 2013). This is reflected by drug trials with minimal differences found between the drug group and the placebo group (Andrews, 2001; Fournier, DeRubeis & Hollon, 2010) and also CBT trials that still produce successful outcomes even when specific features are removed (Jacobson et al., 1996; Longmore & Worrell, 2007). Further criticisms are made of the over-reliance of

medication, and the prevention of the psychiatric patients in question to recover by growing and learning as an individual (Bracken et al., 2013). Criticisms such as these have recently led towards the development of TIA as an alternate approach to dealing with mental distress (see Chapter 10, Section 5.1).

2.11 How Does Traumatic Stress Lead to PTSD? Theoretical Models

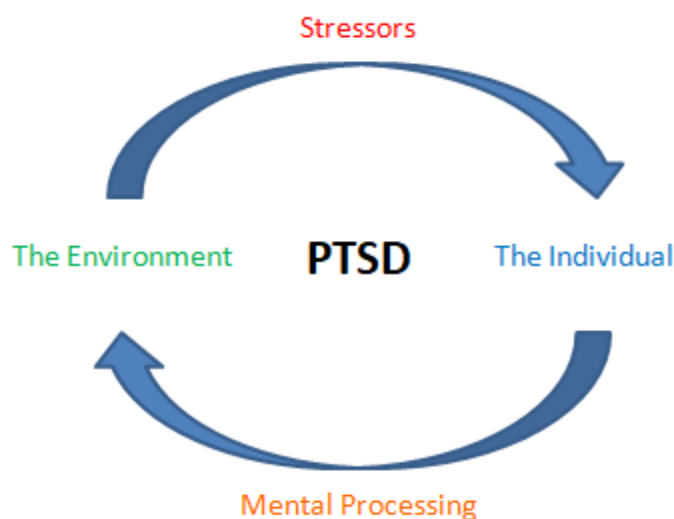
Overall, it appears that the onset of PTSD in the face of traumatic incidents is a result of a complex inter-relationship between individualistic factors and environmental factors. Creating a model that can explain this phenomenon with complete accuracy would be near impossible, as with the case of many aspects of human psychology (Bilder & Howe, 2013). In order to attempt to best describe the complex interaction in the formation of PTSD, models can use the factors that the research literature has so far identified as being a key component in the formation of PTSD.

Figure 2.2 provides a simple diagram for interactions between individual factors and environmental factors in the formation of PTSD, based on medical models of psychopathology. Essentially, the environment creates stressors, and then the individual's mental processing determines how they interpret their environment. If the stressors are intense, or if this cycle continues for too long, then PTSD may result. This is just an abridged model to help explain this phenomenon. A model that provides a more in-depth explanation for the cause of PTSD would outline the different array of causal factors. For instance, the 'individual' factor would instead be sub-divided into components that are suggested to be mediating factors in the onset of PTSD, such as experience (Gayton & Lovell, 2012). Furthermore, due to the complexity of the aetiology involved, models for PTSD at the present may benefit from being designed to represent specific populations, rather than aiming to explain PTSD onset on a universal level. Paramedics for instance are frequently exposed to stressful and traumatic events

(Regehr, Goldberg & Hughes, 2002). Therefore, the environmental and stressor components of a model would include more sub-factors than those of the general population.

Figure 2.2

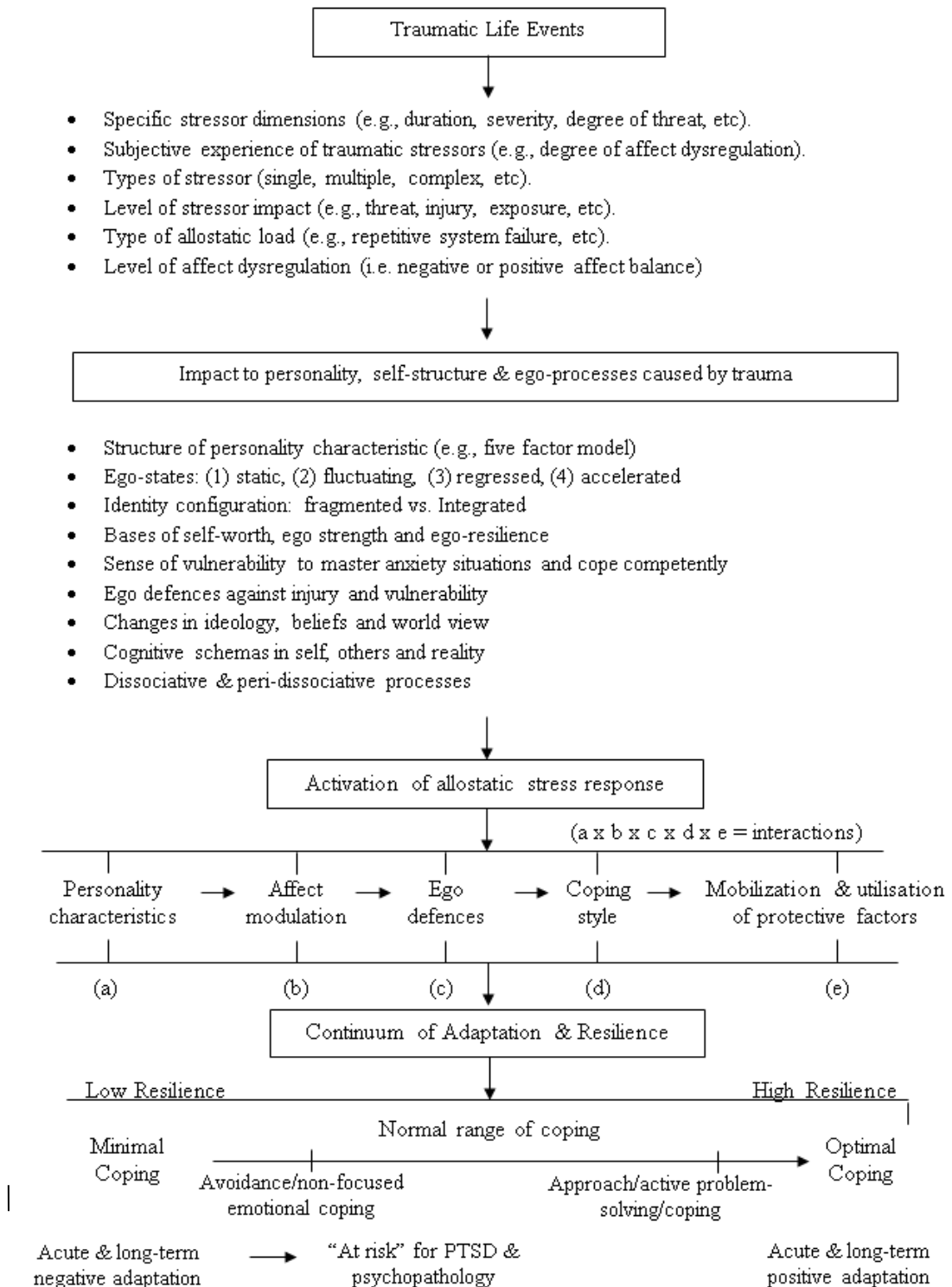
A cycle diagram drafted by the researcher



Researchers have attempted to establish models for PTSD onset that account for the more complex variables involved. Agaibi and Wilson (2005) proposed their model of resilience in response to psychological trauma based on their literature review (see Figure 2.3). Their model is influenced by medical models of psychopathology. While not explicitly stated in the model itself, the definition of resilience by Agaibi and Wilson (2005) was described as “psychological immunity to psychopathology” (Agaibi & Wilson, 2005, p. 2). The use of the term ‘immunity’, being more associated with biology and medicine, gives insight into the influence of medical models in Agaibi and Wilson’s model of PTSD onset. The use of biomedical language applied to the term ‘allostatic’ (the process of achieving homeostasis) is another example of this.

Figure 2.3

A model of the dynamic causal factors of the onset of PTSD after a traumatic event



Note. Reproduced from Agaibi and Wilson (2005).

The model by Agaibi and Wilson (2005) successfully acknowledges the interactions of individualistic factors and environmental factors in the onset of PTSD. For instance, the environmental factors are not simply labelled as just ‘stressor’, but consider the intensity of the stressor, the duration, and the subjective interpretation of this. The subjective interpretation aspect is primarily drawn from DSM-IV, which notably differed from DSM-III by placing emphasis on the victim’s subjective experience of the trauma in the diagnosis of PTSD (McNally, 2004). The current DSM-5, has since removed the emphasis of the subjective experience of the trauma (Pai, Suris & North, 2017). This aspect of the model (Agaibi & Wilson, 2005) may be considered obsolete according to DSM-5. However, the model does acknowledge that PTSD may derive from acute traumatic incidents or chronic traumatic experiences. The role of chronic trauma in the onset of PTSD was not covered in DSM-IV, but was suggested in some research literature (McEwen, 2002; Thomas & Wilson, 2004; Wilson, 2004) and was integrated in DSM-5 (Pai, Suris & North, 2017). This aspect is particularly important in paramedics, as research suggests that chronic work stress is as important contributor to the relatively high rates of PTSD observed in this population, along with acute traumatic experiences (Clompus & Albarran, 2016; Regehr, Goldberg & Hughes, 2002).

Another aspect of the model by Agaibi and Wilson (2005) that makes it suitable for paramedics in particular is the distinction between negative adaptations and positive adaptations, or helpful and unhelpful coping strategies. Studies have shown that the cognitive and coping strategies that paramedics use after traumatic incidents are important in the likelihood of the manifestation of PTSD. For instance, several studies have suggested that avoidance and emotional suppression in the aftermath of traumatic incidents is associated with PTSD in paramedics (Ogińska-Bulik & Kobylarczyk, 2015; Regehr, Goldberg & Hughes, 2002). These examples may be explained within the

avoidance/ non-focused emotional coping aspect of the model by Agaibi & Wilson (2005). Likewise, studies in paramedics suggests that helpful cognitions and coping strategies help reduce the onset of PTSD after critical incidents. Helpful cognitions and coping strategies may include sense of coherence (Streb, Hällér & Michael, 2014), and positive reframing and active coping (Ogińska-Bulik & Kobylarczyk, 2015). The model by Agaibi and Wilson (2005) may explain these cognitive and coping mechanisms in paramedics using their approach/active problem-solving/coping component.

Furthermore, the model by Agaibi & Wilson (2005) is beneficial as, rather than focusing of PTSD specifically, it also considers associated vulnerabilities and experiences of anxiety and depression. Their literature review suggests that populations who are more vulnerable to PTSD are also more vulnerable to experiences of anxiety and depression. This is reflected in their model, which aims to account for resilience “in the wake of psychological trauma” (Agaibi & Wilson, 2005; p. 206) rather than being exclusive to PTSD. Such complexities of a range of subjective experiences of psychological stressors are further highlighted in more recent studies based on ambulance personnel. A systematic review by Petrie et al. (2018) suggested that paramedics possessed prevalence rates of 11% for PTSD, 15% for anxiety, 15% for depression and 27% for general psychological distress. Therefore, the model by Agaibi and Wilson (2005) further displays applicability to paramedics by acknowledging the complexities of subjective traumatic experiences and resilience behaviour, rather than specifically focusing on PTSD alone.

There are aspects of the model displayed in Figure 2.3 that may not be entirely applicable to paramedics. One potential flaw is that the model does not entirely acknowledge external resilience as a mechanism for reducing the onset of PTSD. To clarify, internal factors of resilience are mechanisms to reduce the onset of mental distress, such as PTSD, that are formed within the individual’s own cognitions

(Luthans, Vogelgesang & Lester, 2006; Reches & Sondaité, 2014). Facets of this may include optimism, locus of control, experience and sense of coherence (Alexander & Klein, 2001; Iacoviello & Charney, 2014; Luthans, Vogelgesang & Lester, 2006; Reches & Sondaité, 2014; Streb, Hällér & Michael, 2014). External factors of resilience are mechanisms that reduce the onset of mental distress that are formed from the individual's environment and societal attributes. Facets of this may include levels of work pressure, support from co-workers and social support (Clompus & Albarran, 2015; Dodd, 2017; Reches & Sondaité, 2014). Studies suggest that external resilience is an important aspect for paramedics in the reduction of mental distress, and may be a prominent focus for organisational change to reduce distress (Clompus & Albarran, 2015; Dodd, 2017). External resilience as a component is not outlined sufficiently in the model by Agaibi and Wilson (2005). All protective components in their model relate to internal resilience. External resilience, which is shown to be important in paramedics, is not sufficiently covered in this model. Research however suggests that external resilience is also influential (see Chapter 5, Section 5.3.1).

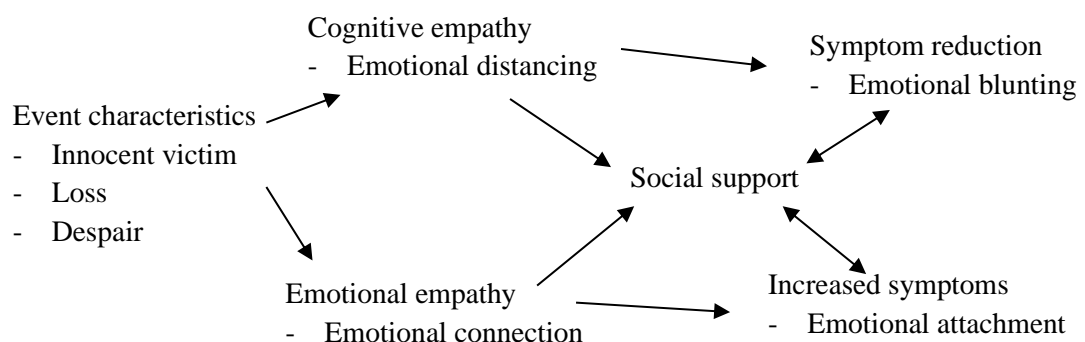
Additionally, another issue with Agaibi and Wilson's (2005) model is that it represents the onset of PTSD as a mostly linear pathway from the traumatic experience or experiences to the resulting symptomology. Some research suggests that PTSD can often be a reciprocal loop, in that the resulting deficit cognitions from PTSD can interact with environmental factors and worsen the PTSD itself (Byrne & Riggs, 1996; Shahar et al., 2013). For instance, reports suggest that paramedics suffering with PTSD become more anti-social and reclusive, which worsens PTSD by reducing their capacity to receive help and support (Quaile, 2016). Therefore, the onset and persistence of PTSD may not be accurately represented as a linear path, but involving reciprocal loops wherein the symptoms have detrimental effects on the environment that make the

symptomology persist and worsen. Future models of PTSD may consider incorporating this aspect.

Researchers have attempted to propose models of mental distress onset more specifically for paramedics. Regehr, Goldberg and Hughes (2002) devised a model based on their qualitative and quantitative research for work stress and trauma in paramedics (see Figure 2.4). Their model does not attempt to explain PTSD specifically; rather it attempts to explain general psychopathology or mental distress. The researchers argue that the primary cause is the nature of the emotional attachment that the paramedics have with the patients. The negative effects of the emotional attachment they describe is known as ‘secondary traumatisation’. Regehr, Goldberg and Hughes (2002) describe secondary traumatisation as the experience of those who develop symptoms of traumatic stress by working with traumatised individuals. A systematic review by Greinacher et al. (2019) noted that there does not appear to be a standardised definition of secondary traumatisation across the literature, much like the term ‘resilience’. They additionally noted that first responders displayed reported rates between 4% and 13% across their systematic review. This was considered lower than expected by the researchers, and possible explanations included higher resilience in first responders and/or self-report bias.

Figure 2.4

A thematic model of the role of emotional empathy in the onset of mental distress in paramedics



Note. Reproduced from Regehr, Goldberg and Hughes, 2002.

Unlike the model by Agaibi and Wilson (2005), the model by Regehr, Goldberg and Hughes (2002) presented in Figure 2.4 acknowledges the reciprocal loop that is observed between access to social support and symptomology. As the onset and persistence of PTSD is a complicated phenomenon, it is difficult for models to provide an explanation for the observed components of PTSD or resilience within them. For instance, there is a current debate as to whether critical incident stress debriefing (CISD) in emergency service workers is helpful, as it allows those involved to seek social support and prevent the blunting of their emotions, or harmful as it essentially forces the individual to discuss the incident when they may not be ready or wish to and re-live the experience (Hawker, Durkin & Hawker, 2011). At present, this appears to be mediated by circumstantial factors and individual differences (Campfield & Hills, 2001). This is just one example of how current models of PTSD find difficulty in incorporating the many factors and environmental interactions associated with the onset of PTSD.

While models of PTSD can help understand its onset and aetiology, similarly to working memory for example (Repovš & Baddeley, 2006), more research is needed in order to incorporate the range of associated variables into a dynamic representation of the formation of PTSD. It may be argued that a model capable of this is not possible, given the vast individual differences that can influence the onset of PTSD. Others may argue that medical models should be discarded in favour of TIA that more completely take into account individual differences and differences in the traumatic experiences (see Chapter 10, Section 10.5.1). Nevertheless, more research is needed to further our understanding of how sometimes traumatic events leads to PTSD, and how sometimes they do not. Attention needs to be paid to the sequence that an intervention or prevention program is implemented to observe how this influences the likelihood of the onset of PTSD.

2.12 Critical Incident Stress Management

While there are a number of different models for the onset of PTSD following a critical event, they all possess the same core structure. Essentially, the models begin with a critical incident, they are then intermediated by an interaction of psychological and environmental factors, and mental distress is a potential outcome. The current project aims to focus on resilience training as a preventative measure. This is essentially a process that would occur before the critical incident, defined by a theoretical model, which could theoretically reduce the likelihood of mental distress being an outcome. However, it is important to consider interventions designed to be implemented following exposure to critical incidents. One particular program that aims to implement this forum of prevention is known as critical incident stress management (CISM).

CISM refers to a systematic process with multiple components, aiming to provide psychological and practical support to those exposed to traumatic events in the workplace (Regel, 2007). While research into the implementation of psychological support following traumatic events began in 1944 (Lindemann, 1944; Regel, 2007), CISM was developed specifically for the emergency medical services (EMS) in the US by Mitchell and Everly in the early 1980s (Mitchell, 1983). This comprises of a number of systematic stages. Most typically, this includes pre-crisis education assessment, debriefing, CISD and, if necessary, specialist follow-up support (Regel, 2007). The overall idea of CISM is to help prevent the development of mental distress after exposure to a critical incident (Flannery & Everly, 2000). CISM usually takes between 1.5 to 3.0 hours to implement, and it is usually held from 72 hours to 14 days after the critical incident (Regel, 2007).

Within CISM, a greater amount of attention has been placed on CISD. CISD is a seven-stage supportive intervention process designed for small groups of people who

experienced a critical incident at work together (Mitchell & Everly, 1997). This aims to reduce mental distress and restore group cohesion and unit performance by using psychoeducation to normalise group member reactions and facilitate their recovery (Mitchell & Everly, 1997). The definition and implementation of CISD has become interchangeable with psychological debriefing, especially in Europe (Dyregrov, 1989; Regel, 2007).

However, research into the effectiveness of CISD has been mixed. The Cochrane Review (Rose, Bisson & Wessely, 2002) conducted a meta-analysis of RCTs for implemented CISDs. Their analysis suggested that CISD did not reduce mental distress compared to the control groups. They further highlighted that one trial suggested that the risk of PTSD increased after CISD after one year. Possible explanations for this effect proposed by Rose, Bisson and Wessely (2002) include CISD focusing too much on managing traumatic incidents rather than mitigating trauma symptoms, secondary traumatisation from 're-living' the incident, placing shame on individuals, and 'medicalising' normal distress. In relation to theoretical models of PTSD onset, implementing an intervention between the exposure to a critical event and the outcome of mental distress may not always have a beneficial impact.

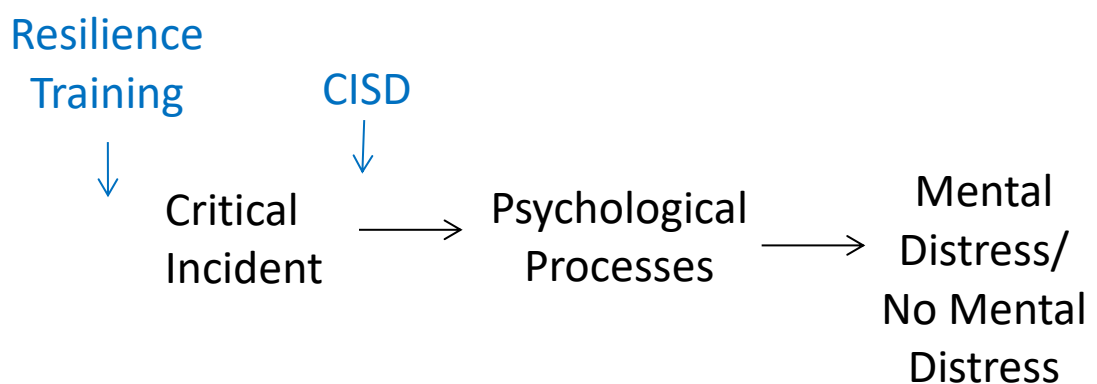
Some researchers have however downplayed the significance of the Cochrane Review (Rose, Bisson & Wessely, 2002). Regel (2007) argues that the studies within the Cochrane review largely contained methodological flaws, allowing for the possibility that better designed studies may be able to demonstrate the value of the approach. He further argues that psychological debriefing/ CISD was psycho-educational in purpose, and was not intended as a 'psychological treatment' designed to prevent PTSD. However, a more recent meta-analysis yielded many of the same conclusions as the Cochrane review with regards to the apparent ineffectiveness and

counter productiveness of CISD (Pia, Burkle, Stanley & Markenson, 2011). The National Institute for Health and Care Excellence (NICE, 2018) have additionally conducted their own evidence review on this subject. Based on their evidence review, their guidelines recommend that psychologically-focused debriefing is not offered for the prevention or treatment of PTSD. This is due to the lack of evidence suggesting that this works, and the evidence suggesting the potential negative impact.

In relation to resilience training, CISD is similarly an intervention that aims to try and prevent PTSD and other forms of mental distress by being implemented before the onset of these. While resilience training aims to be implemented before the critical event, CISD aims to be implemented after the critical event, but before mental distress can originate. Figure 2.5 provides an illustration of this. However, the research literature appears to suggest that CISD is not always successful in preventing the onset of mental distress in emergency workers, and it may also increase the likelihood of this. As resilience training works on similar principles, caution must be taken in related research to monitor any adverse effects.

Figure 2.5

A theoretical model of the use of resilience training and CISD



2.13 Summary of Chapter 2

This section has provided a relatively brief, yet comprehensive outline of the history and historiography of PTSD as a diagnosable condition. This largely outlines how it originated as an assumed physiological condition in soldiers in the late 19th and early 20th century. It was then identified as having a psychological component by Kardiner after the First World War. The Vietnam War then sparked an increase in interest from researchers and clinicians, leading to the inclusion of PTSD as a psychiatric category of illness in DSM-III in 1980. From this point, research in a variety of different populations and traumatised groups increased.

As well as this given history, the conceptual issue of the validity of PTSD has been evaluated. Three different views have been considered. Drawing upon the research and critical commentary on this topic, in my view the evidence suggests that PTSD is not fabricated for ulterior motives as constructionist commentators suggest. It seems that PTSD does possess a real aetiology and represents real human experiences necessitating supportive intervention. The question lies as to how valid our methods of measuring, diagnosing and treating it are, and to what extent these methods are able to do so for all human cultures. Most researchers, questionnaires and treatment approaches are influenced by modern Western cultures that have then been applied to other cultures, rather than researching other cultures to begin with. Therefore, I believe that the truth currently lies somewhere between considering PTSD to be a fully-fledged evidence-based category of mental disorder and a context and culturally contingent identifier of adverse human experiences (view 1 and view 2 in this chapter).

With recent changes via DSM-5 and ICD-11 providing new frameworks for diagnosing and conceptualising PTSD, as well as increased research in paramedics, the information outlined in this chapter is important. As well as providing a history of

PTSD, this chapter also provides theoretical ideas for the future that I believe may become important. A key example of this is the idea that multiple traumatic events experienced on a chronic basis can result in a form of PTSD characterised more by affective symptomology. This idea originates from research in other populations, such as those abused in childhood and 9/11 survivors (Chu, 2010; Cloitre et al., 2013; Lanius et al., 2010). Both DSM-5 and ICD-11 accounts for this form of PTSD in their diagnostic criteria. However, the idea of this more chronic based idea of PTSD has yet to directly be investigated in research on paramedics. Paramedics are more likely to experience distress from their chronic traumatic experiences than their acute traumatic experiences (Regehr, Goldberg & Hughes, 2002). Additionally, this would have an impact on the types of psychometric measures used to measure PTSD in paramedics, as this would need to reflect the way in which they experience trauma that may differ from military soldiers for example (Whiting, Costello & Williams, 2019). Therefore, in this chapter I have identified a key area that has yet to be researched. The suggestion that future research focus more upon the effect of chronic traumatic incidents on the nature of PTSD experienced by paramedics is one aspect of how this thesis contributes to research in this field.

While the history of PTSD as a psychiatric category has been outlined, the conceptual issues and concerns over the successfulness of treatments are still abound. The need to understand and navigate the conceptual complexities of PTSD is becoming more important for those involved in research with paramedics. This is because the traumatic experiences that paramedics more specifically endure appear to be increasing in the UK and other countries between 2008 and 2019. The next chapter will provide an overview of this drawing upon grey literature to investigate these reported issues.

CHAPTER 3: WORK STRESS AND TRAUMA IN PARAMEDICS: THE LAST DECADE

3.1 Introduction

I have so far used research literature to review the conceptual development of notions of PTSD and locate this as relevant to the occupational stress experienced by paramedics, the consequences and potential ways in which help can be provided. However, the research literature is not always the ideal source to explore these issues. Firstly, empirical research aims to be objective (Pyrczak, 2016). This often means that personal opinions or phenomena that are difficult to quantify do not get reported. The experiences that paramedics face often require opinions and qualitative reporting to more fully explain. Therefore, this is difficult to convey in uniquely quantitative empirical literature. Secondly, the past decade has been an incredibly turbulent time for paramedics in the UK, as well as other sectors within the National Health Service (NHS) and public healthcare. The rate at which structural changes, reports of discontent and the resulting consequences have occurred means that the research literature has almost struggled to keep up. What may happen in one period of time may not get published in a related article until several years later. Therefore, when trying to understand why the rates of trauma and PTSD are greater for paramedics than the general population (and increasingly so in the last ten years) it is important to examine the grey literature, including mass media and first-hand accounts from paramedics, as well as the research literature.

3.2 Approach to News Article Inclusion

Online news articles were searched using Google News. No specific inclusion criteria were applied. This was justified because of the availability numerous news sources with a diversity of potentially relevant news stories. It would have been very

difficult to determine appropriate inclusion criteria in advance, which would have been helpful in identifying (and not excluding) the most relevant stories for my purposes; which were concerned with identifying generally illustrative patterns in news, rather than a definitive discourse analysis or quantification .

While my approach was therefore less systematically comprehensive, I was able to select articles that were most relevant to my work while also gauging the frequency of reports about PTSD in paramedics over time. The general pattern observed was that there were scarcely any news articles on this topic from before 2008, and this has substantially increased up until the present day. To get an estimation of this pattern, the key terms ‘paramedics PTSD’ in Google News yielded 72 search results for 2008, 1,130 search results for 2013 and 4,670 search results for 2018. Additionally, the aim of this news media review was to gain a more dynamic picture of the experiences that paramedics undergo and the current changes in their profession. A specific inclusion strategy may have resulted in this objective being undermined by the review simply reporting frequencies of key words. A less specific inclusion strategy allowed myself to become more immersed in the content of the reportage and make more qualitative descriptions of the experience paramedics face.

To find relevant news articles, key words were used. These were essentially a combination of ‘paramedic’, ‘trauma’, and ‘PTSD’. To obtain news articles across different dates, I manually changed the search settings to ensure that I obtained a reasonably even distribution of selected news articles from 2008 to 2018. Not doing so resulted in a skewing towards more recent news articles. The news articles produced from the search were read based on how relevant the title was to the current project. If these were determined to be relevant to the study based on documenting trauma and PTSD in paramedics, then they were selected.

Reading the selected news articles also highlighted some of the associations of trauma and PTSD in paramedics. Examples of contributing factors noted included austerity policies, physical assault from patients and an ageing population. These terms were therefore run back into the search in order to further explore the role these play in the wellbeing of paramedics.

3.3 First Reports of PTSD in Paramedics

One of the first reports of PTSD being greater in paramedics than the general population (see Figure 3.1) coincided with the onset of the global economic recession following the banking crisis of 2007 (Stuckler et al., 2011). The history and events of how the bursting of the US housing bubble predicted upon poorly by conceived credit, led to the worst recession in 60 years has been well-documented (Mulligan, 2009; Varoufakis, 2011; Verick & Islam, 2010). The knock-on effect has resulted in the UK government attempting to shrink the deficit by cutting capital spending and reducing the budget provided for governmental sectors, such as the health sector (Appleby, 2008; Reeves et al., 2013; Stuckler, Basu & McKee, 2010). Consequently, the NHS has suffered since (Smith, 2008), and the effects persist despite current efforts to increase funding (Triggle, 2018). In particular the ambulance service in the UK has suffered as a result (Stone, 2017; The Guardian, 2017). The research literature currently provides little evidence that rates of mental distress such as PTSD has increased in paramedic over the last ten years (et al., 2018) compared to earlier studies (Alexander & Klein, 2001; Regehr, Goldberg & Hughes, 2002). However, the grey literature suggests that the conditions that led to mental distress in paramedics are worsening, and longitudinal studies are needed to fully understand the consequence of this (Stanley, Hom & Joiner, 2016).

Figure 3.1

Headline from The Independent, 2008

Now ambulance workers fall victim to battlefield stress

Crippling condition remains taboo among paramedic colleagues

By Terri Judd | Friday 7 November 2008 01:00 | |



3.4 The Effect of Austerity

As part of the governmental attempt to save costs and improve the performance of the ambulance service, they have closed many of the smaller local ambulance service stations and replaced them with a single larger paramedic hub stations (BBC, 2012; Hirst, 2017). However, it appears that these changes may be having negative rather than positive effects. Firstly, the unification of a region's paramedic station means that 999 incidents are more likely to happen further away from the nearest paramedic. This is further reflected by reports of an increase in ambulance response times in rural areas (Oliver, 2014). Therefore, patient waiting time has been increasing, and paramedics were not meeting the (at this time) stipulated 8-minute waiting time target (Foster & Turner, 2017; Turner, 2015). This often has a further knock-on effect, as the delay of treating the first patient means that the paramedics often do not have a break before then going to treat a second patient (Turner, 2015; UNISON, 2013). This therefore had a direct impact on the mental health of paramedics, as studies show that this intensification of their work is related to physiological and psychological problems (Hegg-Deloye et al., 2014). The lack of break between patients additionally contributes to their mental distress, as studies suggest that not taking time to mentally recover between events contributes to a sense of overload and inability to process traumatic events sufficiently (Alexander & Klein, 2001; Halpern, Maunder, Schwartz & Gurevich,

2014; Ramirez et al., 1996). Furthermore, a novel finding from the online forum study within this thesis (see Chapter 8, Section 8.1) suggests that these paramedic hub stations make it more difficult for the paramedics to talk to certain preferred co-workers about mental health issues. This is because these larger stations are busier and this makes it more difficult to talk confidentially to others. Thus, some of the coping mechanisms used by paramedics may become hindered by this.

Prior to the new ambulance standards in 2017 (NHS England, 2017), several reports suggested that the contemporaneous 8-minute target response time was not supported by clinical evidence (Guardian, 2015; Morris, 2015). This led to situations where a patient whose life was saved after a 9-minute wait was considered a failure, while a patient who was unsuccessfully treated after a 7-minute wait was more likely to be considered a success. Therefore, such reports argued that the 8-minute targets for category-A calls was creating almost unnecessary stress for paramedics (Guardian, 2015), and their performance should be more focused on how they treat their patients rather than how fast they reach them. New mandated ambulance standards (NHS, 2017) have reduced the average response time target for category-A calls to 7 minutes. However, this change aimed to reduce stress on paramedics by increasing the time allocated to assessing the call and establishing the emergency from 1 minute to 3 minutes for non-life threatening calls (Turner et al., 2017). The original research which developed and evaluated the new ambulance standards suggests that this will help ensure that the correct response vehicle is sent the first time, and will improve efficiency, reduce stress on paramedics and make the target response times more clinically effective (Turner et al., 2017). Follow-up research is currently needed to evaluate this fully. Nevertheless, this does suggest that aims to make positive changes in the ambulance service structure are possible.

The paramedic workers themselves have been directly affected by governmental efforts to save costs. For instance, in 2017 paramedics at the South East Coast ambulance service were informed that they would no longer be paid for working during their 30-minute meal break; the only break in their 12-hour shift (Campbell, 2017). In 2018 paramedics from the North West Ambulance Service (NWAS) went on strike as their jobs had not been re-evaluated between 2005 and 2016, raising existential concerns over the value of their roles as well as issues of appropriate remuneration (Lezard, 2018; Naylor, 2018).

Additionally, there have been complaints that the retirement age for paramedics to receive a pension is currently 67 years of age, while this is 60 years for all other uniform services (UNISON, 2018). For a high stress and physically demanding job such as that of a paramedic, it is believed that working until the age of 65 years would have a detrimental effect on the physical and psychological wellbeing of those individuals (UNISON, 2013). Due to these conditions, many paramedics are leaving the profession creating a workforce crisis that places additional pressures on those left in the workforce. It has been reported that there are 1000 vacant posts across the UK ambulance services, including more than 350 vacant posts for the London Ambulance Service (Campbell, 2018). More than 1000 paramedics left the service between 2014 and 2015, which is nearly double the figure of 566 who left between 2010 and 2011 across the UK (National Health Executive, 2015). This issue was already pressing, as in 2010 the ambulance service kept vacant posts unfilled as part of efficiency savings, and other ambulance crew members such as emergency medical technicians (EMT) and emergency care assistants were being phased out (Turner, 2015). Yet in the past few years, it appears that this has been compounded by overly stressful working conditions and lack of support resulting in many paramedics leaving the profession (Fox, 2017; Wakefield, 2014). So far, ideas and methods to help curb this include recruitment from

abroad (Campbell, 2018), recruiting volunteer and military drivers (Marsh, 2018) and increasing the usage of private ambulance services (Turner, 2015). Yet currently, the paramedics who have not left have to work even harder to cover for the lower staff numbers, and this is taking a toll on their health and wellbeing (Marsh, 2018). The headline in Figure 3.2 exemplifies this.

Figure 3.2

Headline from The Guardian, 2015



We paramedics save lives but NHS cuts have stretched us to breaking point
The Secret Paramedic
Time-driven targets and too few staff mean the public is in danger

3.5 The Ageing Population

So far, a lot of issues that paramedics face which I have outlined have largely arisen as a direct result of budget cuts in response to the harsher economic climate (Morris, 2015). However, many of the current issues can also be attributed to either more indirect consequences of budget cuts, or other factors. One major factor is the general increase in life expectancy, producing an ageing population. Advances in modern medicine and lifestyles over the last century have caused the worldwide average life expectancy to increase from 47 years in 1840 to 65 years for men and 70 years for women (Oeppen & Vaupel, 2002). As of 2016, the UK population was approximately 65.6 million, with 18% being aged 65 years and over (Office for National Statistics, 2017). These modern advances mean that the old age dependency ratio (OADR) is increasing; in 2016 there were 285 people aged 65 years and over for every 1000 people between 16 and 64 years old (Office for National Statistics, 2017).

Because of this ageing UK population, it is estimated that 66% of hospital beds are occupied by people over 65 years, and these patients often have complex needs (Triggle, 2012). Despite this increase in OADR, neither the NHS nor the ambulance service has sufficiently expanded over the last ten years to help deal with this accordingly. Despite some politicians and media outlets vilifying the poor and immigrants as ‘drains on the NHS’, reports suggest that most 999 calls that paramedics deal with are to attend the elderly (Guardian, 2017). Due to the elderly having more chronic health conditions, they require 2.5-5.0 times greater NHS resources than the average 30-year-old (Triggle, 2018). The lack of financial support towards the ambulance service in recent years has meant that they have not been able to expand sufficiently to meet this growing problem (Triggle, 2018; see Figure 3.3). Hence, many of the ongoing work stresses that paramedics’ face stem from this (UNISON, 2019; Wittenberg, Sharpin, McCormick & Hurst, 2017).

Furthermore, it is apparent that as other aspects of the NHS are affected by budget cuts and structural reorganisation, the ambulance service often has to take up more responsibility for patients. Since 2010, budget cuts have caused the closure of community walk-in health centres that were important for the elderly and those with chronic health conditions (Campbell, 2018; Wheeler, 2012). Over the past decade, 95 walk-in centres, representing 40%, have been closed in the face of criticisms that they were not cost-effective. It is believed that the closure of these centres has resulted in an increase in 999 calls and the use of the ambulance service to treat patients and transport them to hospitals located further away (Turner, 2015). Additionally, these increases in demand on hospitals appear to result in more patients being discharged despite not fully recovering (Cooper, 2015). This has a knock-on effect for paramedics being more overworked by having to treat and transport these same patients more than once (Turner, 2015). Therefore, the increase in pressure on the NHS as a whole generally

results in paramedics being depended on more, and made to work harder to help treat and transport patients in an increasingly OADR population who have reduced access to community walk-in health centres.

Figure 3.3

Headline from East Anglian Daily Times, 2017

MP is 'highly concerned' for patient safety if 10 Suffolk ambulance stations close

PUBLISHED: 06:19 07 July 2017 | UPDATED: 17:23 07 July 2017 | [Andrew Hirst](#)

3.6 Traumatic Experiences: What do Paramedics Witness?

Recourse to a wider body of articles and commentary can therefore help us understand more about why paramedics have been more frequently exposed to stress and experience more mental distress over the past decade or so. Before 2008, the research literature was suggesting that rates of mental distress were greater in paramedics than the general population (Alexander & Klein, 2001; Regehr, Goldberg & Hughes, 2002). However, empirical quantitative research such as this is often compelled to congregate the personal experiences of paramedics into statistical averages and data. Attention to the online forum qualitative research and using grey literature such as news articles can potentially help inform us more of the nature and degree of traumatic experiences that paramedics endure.

Critical incidents involving victims who required the attention of paramedics can be found in news articles. Examples provided at this moment include a dog walker taken to hospital after being hit by a car (Dresch, 2018), a murder victim by knife attack that paramedics could not revive (Whittingham & Bazaraa, 2019) and a motorcyclist

taken to hospital with serious injuries after a car collision (Burnett, 2019). In all of these incidents, the victims understandably received the focus of attention. The paramedics themselves however are often affected by these events, and this secondary trauma often goes unreported. In the last several decades, there has been a greater push by society to raise mental health awareness (Patel et al., 2007). This has therefore led to a number of separate news articles highlighting the mental distress that paramedics' experience. These are often congruent with what research articles contribute on this subject, or uncover more novel findings.

An obvious aspect of paramedics' work that many find distressing is the graphic injuries they frequently encounter. Witnessing brutal fatalities is unsettling for most people, and is often associated with symptoms of PTSD (Carson et al., 2000; Naifeh et al., 2017). While this aspect has been more commonly associated with soldiers, recent news articles have drawn attention to paramedics also being affected. An interview with a retired paramedic recalls some of the distressing injuries that she had to treat, such as treating people with lungs missing or suicides by hanging (Kirk, 2015). She retired due to suffering from PTSD, and cited that her experiences resulted in nightmares, guilt and self-blame, which were compounded by the high work demands of the profession.

Interviews with paramedics suggest that critical incidents involving children are among the most distressing. This observation supports research findings (Regehr, Goldberg & Hughes, 2002). First person interviews suggest that incidents can be more distressing if the paramedics at the scene have children of their own, due to the empathetic connection (Little, 2011). Nevertheless, child deaths are especially distressing for paramedics in general due to the sheer emotions experienced, and the knowledge that the children involved should have been allowed to live longer (Bieman, 2019).

The distress that paramedics experience with child injuries or death highlights that it is sometimes the emotional connections that make their job distressing, rather than the brutal, more obvious direct observation of gross physiological damage. One news interview with a paramedic helps convey this (Harris, 2018). Despite witnessing an array of brutal and shocking experiences such as car crash deaths or dead bodies that had gone unnoticed by neighbours, the paramedic in question cites their most distressing experience as an elderly man who passed away, while his wife witnesses the paramedics' efforts to save him. An interesting novel research project would be to see if the aetiology of PTSD developed by paramedics is differentiated between the experiences of witnessing graphical injuries and the emotional trauma from empathetic connections formed or imagined to the victims. This emotional aspect may be a factor as to why paramedics reportedly display greater levels of PTSD compared to other emergency workers (Berger et al., 2012).

3.7 Primary Traumatic Experiences

As well as secondary trauma, paramedics are often victims of primary trauma while working. During their work they may sometimes be attacked by drunken individuals, disturbed or distressed mental health service users, or disrespectful individuals (Bigham et al., 2009; Boyle et al., 2007). The research literature suggests that 75% of paramedics experience violence in a given year (Bigham et al., 2009), and 30% may experience distress as a result of this (Regehr, Goldberg & Hughes, 2002). Grey literature such as news articles can help provide more information about the more nature of this problem, how they impact the paramedics' wellbeing and proposed measures that are being considered.

Figure 3.4

Headline from The Guardian, 2018

Ambulance staff face rise in physical and verbal sexual assaults

Number of annual incidents in England has almost trebled over last six years, NHS figures show

The concerning news is that in the UK violence against paramedic staff appears to be on the rise, as seen in the headline in Figure 3.4. Figures reveal that recorded incidents increased from 52 in 2012-2013 to 145 in 2017-2018 (Campbell, 2018b). Being assaulted by individuals that the paramedics are trying to help can only contribute to growing concerns that they are being taken for granted by the general public who seem not to recognise their value and importance (Morris, 2019). The NHS has a zero-tolerance policy to threats or violence towards their staff, and any incident should be reported to the police (Campbell, 2018b). Yet, there are growing reports that police response times are increasing for when they are called in to help paramedics being assaulted (Donnelly, 2018). This police response time increase is attributed to the drop in the number of police officers in the UK since 2009 (Donnelly, 2018; Schraer, 2018). This is another example of how paramedics are being further affected by budget cuts in other public sectors. Proposed solutions to help curb this problem include teaching paramedics self-defence lessons (Donnelly, 2018) and giving paramedics body cameras to wear (The Guardian, 2018b). However, there are further concerns that these methods will only add to their already busy schedules and abundance of responsibilities (Donnelly, 2018). These methods may also send the message that paramedics are essentially 'on their own' and cannot rely on other sectors for help despite paramedics being the ones who help others (Morris, 2019).

3.8 Coping Mechanisms

One way that paramedics help to cope with the lack of outside support is to support each other. News articles report that paramedics often talk to each other about critical incidents to help deal with the emotional impact and make sense of it (Comeau, 2016; The Guardian, 2015). These reports suggest that paramedics tend to confide in co-workers because they believe that they understand the shared experiences more, and will not find it as distressing as someone outside of paramedics (Comeau, 2016; The Guardian, 2015). This was also observed in the online forum study (see Chapter 8, Section 8.1).

An increasing concern however is that due to the growing demands placed on paramedics at work, they are finding less time to be able to talk to their co-workers (The Guardian, 2015). The increase in workload, the longer times driving due to the closure of smaller ambulance stations, and the relocation to larger paramedic hubs where privacy is scarce means that it is apparently becoming more difficult for paramedics to talk to each other about critical incidents, and hence deal with stress. Endeavours are being made to provide more outside support to paramedics. For example, Mind's Blue Light Programme has developed support groups and hotlines for paramedics as well as other emergency response workers (Mind, 2015; Mind, 2016). Several reports suggest that paramedics would still rather talk to a co-worker than 'a random person' (The Guardian, 2015). Nevertheless, further research and reporting is required to evaluate the effectiveness of outside support for paramedics, or to find ways of fostering and maintaining inside support.

Media reports additionally highlight the concerning issue of the effects for paramedics who lack this inside support. Research articles also outline the prevalence of stigma towards mental distress declared by paramedics and its effect on mental health

(Haugen et al., 2017). Despite growing managerial and trade union interest in mental health support within the workplace (Stevenson & Farmer, 2017; TUC, 2018; WHO & ILO, 2000), workmate's responses to colleagues who declare they are struggling with their mental health, or who hide this while performance suffers, have not always been positive.

One of the earliest reports of PTSD in paramedics in mainstream news articles described the case of a paramedic 20 years into his career when diagnosed with PTSD that resulted in co-workers leaving a letter with abusive and degrading jokes pinned to the station notice board (Judd, 2008). With a societal push to increase mental health awareness (Patel et al., 2007), it is likely that these issues are less prominent than they were in 2008, though stigma is a difficult aspect to measure due to self-report bias (Mak, Poon, Pun & Cheung, 2007). Issues concerning stigma towards mental health in paramedics however remain present in some areas today. In 2017, a paramedic committed suicide after warning colleagues that the work stress was getting too much, and it is thought that his workplace had issues with bullying, harassment and intimidation towards those with mental health issues (Clarke-Billings & Bett, 2017). Other reports suggest that a work culture of bullying and stigmatisation towards mental health issues makes it more difficult for affected paramedics to seek help (Merritt & Taylor, 2018), and any support offered by their employers were largely considered to be inadequate (Walker, 2018). More research is needed to further explore the extent of these issues, but it does appear that some paramedic stations may have issues with the manner in which those with mental health issues are treated. Media reports can therefore add to our knowledge by highlighting the personal effects that stigma towards mental health has on individual paramedics.

3.9 The Legal System

An interesting point that journal articles have not covered in this area is the possibility that paramedics could potentially use the legal system as a way of responding to their greater vulnerability to mental distress and lack of support to protect against this. This appears to be a rare occurrence, with only one reporting of this in the grey literature. In 2004, a former paramedic sued the Ambulance Service for £5000 after claiming that he was left with PTSD due to his experiences at work that his employers failed to provide adequate support (Manchester Evening News, 2004; Narain, n. d.). At the time, there were concerns that this would lead to other paramedics and former paramedic doing the same and resulting in high costs for the NHS. However, there have been virtually no reports in the UK since of paramedics taking legal action against the ambulance service or the NHS. Reasons why can only be speculated upon, without any real evidence for support. It is possible that these legal cases have occurred but have not been reported in the media. Alternatively, the legal process of suing can be an expensive and time-consuming process, especially when suing over mental health-related issues (MacEachen et al., 2010; Weiner & Wettstein, 2013). Hence, paramedics as well as other vulnerable workforces may be less inclined to use the legal system in response to their mental distress caused by their job. Additionally, most paramedic ultimately work under the NHS (Woollard, 2015), which is fundamentally a non-profit organisation that aims to provide free healthcare. Therefore, there exist ethical concerns over whether it is acceptable to sue the NHS or the Ambulance Service (Healthcare Claim, 2017; Toynbee, 2017) or whether successful claims will cause further defragmentation to already financially stretched services. While more research is needed to explore the apparent lack of legal activity with regards to paramedics and PTSD, it is possible that the ethical concerns over suing non-profit health organisations is a factor in this.

3.10 Do we Understand the Extent of this?

Due to the stressful and intense nature of paramedics as a profession, rates of PTSD have always been higher for this workforce than the general population (see Chapter 2). As outlined above, the intensity of paramedics' work in the UK appears to have increased over the last ten years due to a range of factors, many of which stemming from the worst economic recession since before the NHS was created (Mulligan, 2009; Stuckler et al., 2011; Verick & Islam, 2010), and an increasing OADR population (Triggle 2012; Triggle, 2018). The headline in Figure 3.6 suggests that this is indeed worsening. Over the past few years, most research in this area has focused on treating, preventing and understanding the aetiology of PTSD in paramedics using resilience training, psychological therapy and digital interventions (Gilroy, 2018; Hayes, 2018; Wild et al., 2018). While an increase in focus on this area of research is welcomed, no empirical studies appear to have examined if PTSD and other mental distress in paramedics in the UK have increased since this turbulence in their profession from around 2009 onwards. A meta-analysis by Petrie et al. (2018) pools together studies from before and after this cut-off point, showing that this potentially important research question is being missed by researchers. The presentation of the evidence makes it difficult to determine whether the rates of PTSD in paramedics found in a more recent study by Regehr and LeBlanc (2017) were greater than that observed in an older study involving Regehr, Goldberg and Hughes (2002). The reported increase in work intensity from the grey literature may not be entirely empirically-based, but it suggests that paramedics are very likely to be suffering more than they were prior to 2008. If more is not done to help alleviate these issues, then the consequences for the wellbeing of paramedics could be drastic.

Figure 3.5

Headline from The Independent, 2017

Understaffed and underfunded NHS ambulance services ‘getting worse’, watchdog warns

Overstretched hospitals are said to be having a knock-on effect on other services

Emergency workers across different nations have been facing similar issues to that of the UK. Extremely concerning news reports in Canada have recently suggested that as well as PTSD, suicide rates may be greater in paramedics than the general population. A documentary in Canada titled *After the Sirens* highlights the incidence of PTSD and suicidal propensity in paramedics, and suggests that 56 per 100,000 paramedics died of suicide in 2016 (Eastwood & James, 2018; Scoretz, 2018). Further reports from Canada highlight the potential elevation of suicidal propensity and PTSD in paramedics (Carleton et al., 2018; Koopmans, Wagner, Schmidt & Harder, 2018). It is not clear whether the extent of this has always been the case in paramedics, or if this is a phenomenon of the last ten years due to the effect of the economic climate on public healthcare (Bezruchka, 2009).

Figure 3.6

Headline from The Guardian, 2015

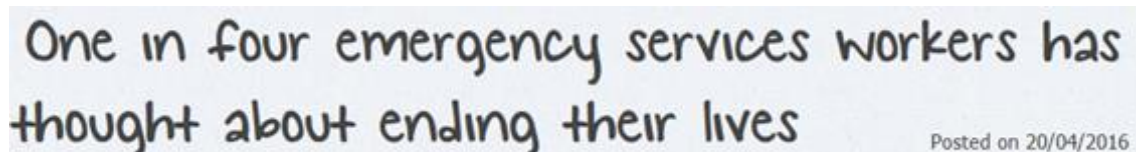
Paramedics take 40,000 days off sick with stress as strain on NHS takes toll

Pressures of the job and dealing with trauma bring rise in mental health issues for 999 workers

Currently, there are no reports that this issue is as severe in the UK as it is in Canada. While reports suggest that paramedics currently have high rates of sickness absence (see Figure 3.7), paramedic suicides in the UK are currently being reported as minority, isolated incidents rather than a prevalent factor (Boniface, Hall & Miller, 2016; Clarke-Billings & Bett, 2017; Probert & Richardson, 2019). However, an online poll research by the Mind (2016b) found that one in four emergency service workers in the UK have contemplated suicide (see Figure 3.8). If working conditions do not improve for paramedics in the UK, it is possible a similar response could occur (Klonsky & May, 2014). It may even be possible that the recorded rates of paramedic suicide in the UK are already at high levels, but unlike in Canada this has not yet been sufficiently reported. As mentioned above, a large number of paramedics are leaving the service to pursue less stressful occupations (Campbell, 2018; NHE, 2015). Indeed, the study by Mind (2016) suggested that 27% of emergency service workers have contemplated taking their own lives, while greater numbers (63%) contemplate leaving their job due to their poor mental health. It is therefore possible that UK paramedics are managing to leave the profession before the profession drives them towards more drastic decisions. Research is urgently required to further investigate the extent of these issues in the UK.

Figure 3.7

Headline from Mind, 2016



One in four emergency services workers has thought about ending their lives

Posted on 20/04/2016

3.11 Using the Grey Literature: Pros and Cons

The points and arguments made from this section are based largely on grey literature and media reporting, most notably online newspaper articles. This source of information contains several advantages and disadvantages compared to published research literature. It is important to understand how advantages and disadvantages. Thus, this will be discussed briefly.

A useful advantage of newspaper sources is that they provide contemporary information and insight on issues and phenomenon that are currently happening. Research journals have to go through lengthy peer-reviewing processes before dissemination of information to a wider audience is allowed (Ware, 2008), and even this often excludes the public via academic publishing paywalls. Furthermore, it may take years before information published in journals becomes common knowledge as follow-up tests to measure reliability etc. are conducted (Levin, Whitener & Cross, 2006; Spitzer, Endicott & Robins, 1978). While these processes are necessary to ensure that invalid information does not becomes false knowledge among lay audiences, it does often mean that current issues and phenomenon are not tested and published in journals. Typical newspapers and online newspapers, as well as other forms of grey literature are capable of quickly dispensing information about events in the world that may otherwise take longer to learn about (Garrison, 2000).

In relation to the current topic, journal articles tell us that paramedics are at greater risk of suffering from mental distress than the general population (Alexander & Klein, 2001; Regehr; Goldberg & Hughes, 2002; Petrie et al., 2018). However, empirical research in journal articles so far provides little insight as to whether this has increased or decreased in the UK between 2008 and 2019. This is a pressing question, as the increase in austerity in the UK in this time is possibly an influential factor. As

highlighted in this chapter, the news articles do overall suggest that the increase in austerity is associated with an increase in mental distress for UK paramedics, suggesting a research gap that may merit further inquiry. In this situation, the news articles were an important source of information that suggested answers to key questions of context that journal articles were not able to do.

As mentioned, peer reviewed journal articles go through extensive review processes before their content is made available to others, and potentially become common knowledge (Ware, 2008). This is often an important aspect which newspapers and grey literature do not possess. Thus, any invalid or inaccurate information may become believed by others and have negative consequences. For instance, the study by Mind (2016) which suggested that one in four emergency service workers have contemplated suicide was based on an online survey of with a sample size of 1600. While this is a fairly large sample size, the fact that it was conducted by Mind (a mental health charity) means that the individuals who engaged with their study were more likely to have mental health problems to begin with in order to be aware of the study. Thus, one may argue that follow-up research is needed to check if this high level of suicidal contemplation really is prevalent in paramedics.

Similarly, the interview with the retired paramedic in the Guardian from Kirk (2015) was insightful and useful in terms of an information source, yet it was the views and experiences of just one paramedic. Therefore, it may not be reasonable to assume that the powerful and hard-hitting points made in that article were representative of all paramedics in the UK. Furthermore, newspapers may not always be the most reliable source of information, as they do sometimes substitute the quality of their sources in favour of startling headlines that increase sales (Lacy & Fico, 1991). Therefore, caution must be ensured before taking the information provided by newspapers at face value,

especially considering that some of the information and headlines provided in relation to paramedics and trauma can themselves be startling.

3.12 Summary of Chapter 3

Overall, this argument based on the grey literature (mostly news articles) suggests that the traumatic experiences and work stresses that paramedics' in the UK face have been exacerbated by a range of factors. This mostly originates from a reduction in financial resources meaning that they cannot match the demands of providing emergency care for an increasing OADR population.

With respect to the current thesis project, this raises several important points. Firstly, it is debateable whether the fostering of psychological resilience in paramedics would be a helpful method of addressing these issues, or whether this is essentially placing the blame and the responsibility on the paramedics themselves. Secondly, questions can be raised regarding the training of paramedics to process stressful stimuli more efficiently, since this may not address the fact that they have experienced a number of negative changes to their work environment. These approaches may be viewed as an attempt to absolve the responsibility of the hazardous economic policies that caused the global recession (Mulligan, 2009) or the governmental officials who chose to try and alleviate this problem by making budget cuts that affected the most vulnerable areas of UK society (Kushner & Kushner, 2013; Stuckler, Basu & McKee, 2010). From observing the above information from the news articles, it seems clear that psychological resilience training would not be enough to fix the issues that paramedics have had to face over the last ten years. It may nevertheless help even by a small amount, and it is therefore still worth researching.

This chapter further highlights the need to have more research into work stress and exposure to critical incidents in paramedics in the UK, and how this has changed in

more recent times. While this grey literature suggests that this is worsening due to a number of factors, such as budget cuts and increasing OADR, research has not yet explored the specific effects of these recent factors. Hypothetically, an increase in a paramedic's work stress could result in a reduction in their resilience, and an increase in vulnerability to PTSD. I therefore argue that empirical research needs to explore the effects of these recent changes on the paramedic workforce, and focus more on the effect of the external environment on PTSD, rather than simply the critical incident and PTSD itself. More empirical research would help bring further attention to these issues, as opposed to reliance on the grey literature alone.

One area that may be the focus of future research is the use of digital technologies to help reduce mental distress in paramedics (Dodd, 2017). This is one of the aims of my study. Digital technologies may have an increasingly important role in mental health, as the next chapter will outline.

CHAPTER 4: DIGITAL PROGRAMS FOR MENTAL DISTRESS

4.1 Introduction

The previously reviewed extent and severity of occupational stress facing paramedics forms the basis for a compelling case to devise approaches to help alleviate this. This leads to the aim of developing a digital program that can provide self-taught resilience training specific to paramedics as a population. This may reduce rates of trauma symptomology in paramedics, especially as the content and aspects of resilience were based on paramedics' own view, opinions and experiences (see online forum study, Chapter 7). While this specific research approach is novel, there have been other digital programs designed to help alleviate mental distress in either general populations or targeting specific populations. Furthermore, these programs, as well as research related to them, have expanded in the last few years. To understand the uniqueness of the current project, these other programs should first be highlighted and discussed. Programs such as these can be found from both research literature and searching the grey literature using general internet search engines. Furthermore, to understand the potential importance of the current project, the potential implications of digital programs in mental health must also be outlined.

Traditionally, psychological intervention programs were conducted face-to-face with a qualified psychologist with specialist training in an area of mental health (Cuijpers, van Straten, Smit, Mihalopoulos & Beekman, 2008; Rowland & Goss, 2013). This therapy may take many different forms depending on the mental distress itself (Beutler, 1979 Rowland & Goss, 2013), cultural differences (Burman, Gowrisunkur & Sangha, 1998), the medical or psychological models used (Alarcon, 1995; Wampold, 2013) or the individual practitioner (Cook, Biyanova, Elhai, Schnurr & Coyne, 2010). For therapies that rely on cognitive theories of psychology, the fundamental principle is

that mental distress is mediated by unhealthy thinking patterns, and using therapy to correct those thinking patterns helps alleviate this distress (Beck, 1993; Floyd & Scogin, 1998). This principle is the same for resilience training. This aims to teach individuals healthy cognitive techniques beforehand to help prevent or reduce the onset of mental distress (Fletcher & Sarkar, 2013; Seligman, 2011). Digital programs for psychological self-help (DPFPSH) essentially aim to replicate the psychological help provided by qualified practitioners into a computerised device that can present the related information and techniques that users can engage with themselves (Fairburn & Patel, 2017). Self-help psychological therapy books have been available for several decades (Ellis, 1993), yet the capability of using computerised technology to facilitate psychological self-help has opened up new possibilities in this area. This includes the potential for programs that target prevention as well as those targeting amelioration of extant distress.

4.2 Contextual Background

To understand the potential benefits of digital technologies in addressing mental distress, we must first remind ourselves of the socio-economic landscape from 2008 to 2019. Limited access to mental health services is a significant issue according to the Department of Health (2014), which states that the UK currently has the potential for improvement in access to mental health services. In 2008, while 23% of disabilities in the UK were related to mental ill health, only 11% of the annual secondary care health budget was allocated to mental health services (Department of Health, 2009; Department of Health, 2014; WHO, 2008). This imbalance of resource distribution was attributed to prioritising physical wellbeing, a lack of cultural support for those suffering from mental health issues and lower funding for mental health (Department of Health, 2014). Obstacles such as this may be further exacerbated by long waiting times

to see a professional (Department of Health, 2014) and mental health services having difficulties with reaching out to different cultures in society (Sadavoy, Meier & Ong, 2004; Sentell, Shumway & Snowden, 2007). Furthermore, individuals from certain backgrounds may possess difficulties with reaching out to psychological health services due to issues, such as the stigmatisation observed in work cultures, e.g. first responders (Haugen et al., 2017; Royle, Keenan & Farrell, 2009).

The Department of Health (2009) highlighted the disparity in mental health funding in 2008. This provided recommendations for improving mental health services and access by 2020. However, many of those recommended targets do not appear to have been met so far. The economic recession of 2008 led to large-scale government reforms in a wide array of sectors (Hodgson, 2009; Knapp, 2012). This led to financial cuts in healthcare, resulting in a reduction of resource allocation (Stuckler et al., 2018), and the recommended targets for improvements by the Department of Health (2014) have therefore not been met so far. Additionally, the economic recession itself has led to an increase in mental health issues across the general population due to unemployment, insecurity of the future and more competitive markets (Evans-Lacko et al., 2013; Knapp, 2012; Stuckler et al., 2018). It is purported by researchers such as Evans-Lacko et al. (2013), Stuckler et al. (2018) and Knapp (2012) that the more difficult economic climate over the last decade has led to increases in suicide rates (NHS, 2012), depression (McInerney, Mellor & Nicholas, 2013) and stress-induced psychosis (Lasheras & Bobes, 2014). This has further increased pressure on health services which are still currently struggling to meet these intense demands (Faculty of Public Health, 2009).

4.3 Current Plans and Initiatives

Almost paradoxically, the increase in mental distress from 2008 to 2019 due to the socio-economic climate has increased the awareness of mental health issues, advocating for more governmental interventions to be made (Macintyre, Ferris & Quinn, 2018; Stuart, Sartorius & Thornicroft, 2019). Hence, governmental policies, charity organisations and researchers have increased their efforts in addressing issues such as these. The governmental appointment of a minister for suicide prevention aimed to tackle the immediate problems of increased suicide rates (BBC, 2018). Additionally, other initiatives are being used to help improve mental health in the long term. The ten-year plan by the NHS aims to provide an array of mental health services outside of main NHS hospitals that hope to both address mental distress in the general population and reduce the strain on the core NHS resources (Mental Health Today, 2019). For instance, the plan aims to develop crisis cafes, sanctuaries and safe havens for those experiencing a mental health crisis which does not specifically require A&E admission.

Furthermore, the focus on long-term mental health improvement is being instigated in schools, with large-scale mental health trials designed to provide mental health education and teach mindfulness techniques being undertaken (Hinds & Mancock, 2019). Approaches such as these are additionally extending into the ambulance services. In 2014, the East Midlands Ambulance Service for example set up initiatives such as the peer 2 peer program and the Pastoral Care Workers Service in order to improve support among co-workers and provide further external support for paramedics (Dodd, 2017). Also, the mental health charity Mind (2016) developed the Blue Light Pledge in order to help emergency first responder organisations such as the police and ambulance services with mental health issues.

4.4 The Use of Digital Interventions

Actions to help improve mental wellbeing have largely been in response to the increasing reports of mental distress in worryingly large proportions of the general population from 2008 to 2018 (Stuart, Sartorius & Thornicroft, 2019). During this period, digital technologies have been increasingly used to help alleviate mental distress (Ruzek & Yeager, 2017). In terms of improving access to mental health assistance, many researchers believe that digital technologies have the potential to be a vital tool. The rapid expansion of internet and mobile technologies has allowed the information and help usually provided by in-person therapists to be available even in low-resource settings, where this help would otherwise not be available (Fairburn & Patel, 2017; Ruzek & Yeager, 2017). This advantage may also apply to paramedics as a workforce. The busy and unpredictable nature of paramedics often means that workers find it difficult to get time off to seek professional help (Haugen et al., 2017). The report by UNISON (2013) suggests that 89% of ambulance staff workers do not have any choice in the shifts that they work. Additionally, it is not uncommon for paramedics to find themselves working two or three hours longer than they initially expected to on a given day due to the unpredictability of overtime (Regehr, 2005). Digital interventions can however be used at any given time that the user chooses without any form of prior arrangement (Ruzek & Yeager, 2017). Also, they do not have to be used in scheduled sessions that may last for an hour or two, but can be used in shortened chunks, for example during a lunch break. Smartphones devices are currently believed to be owned by 66.5% of the world population (Molla, 2017), making a vast number of people capable of using mental health applications on their phone (Gire et al., 2017). Thus, the use of digital devices in populations that may struggle to obtain in-person psychological care could provide the psychological help that they need.

Another potential advantage of DPFPSH is cost-effectiveness. Obtaining information on the cost of in-person psychological services is difficult, but some estimates suggest that this may cost the UK around £47 billion per year (Boseley, 2018). Generally, this cost to help improve the wellbeing of those suffering from mental distress in the UK is considered worthwhile, especially given some reports suggesting that detrimental mental health across the UK costs the nation between £70 billion and £105 billion per year (Wykes et al., 2015). Yet while £47 billion is spent per year to combat mental distress using the same or similar established techniques, a much lower sum of £115 million per year is spent on mental health research (Wykes et al., 2015). This therefore means that the probability for new methods of treating mental distress in the UK to be discovered and trialled is hindered. Therefore, alternative cost-effective approaches to mental distress should be considered to help overcome this barrier.

DPFPSH may be one alternative that can help alleviate this issue. The cost of developing these programs vary depending on the type and sophistication of the technology and the workers involved. A mobile application may for example cost from £19,300 and £750,000 to develop (Savvy Apps, Oct 2018). This range is considerably lower than the current figures on expenditure for treating mental distress across the UK (Olf, 2015). Furthermore, DPFPSH are cost-effective for the individual users themselves (Ruzek & Yeager, 2017). A webpage from *In Equilibrium* (2019) provides details for a range of mental health mobile applications, most of which are free, and the most expensive being £4.99. Thus, the development costs and the costs to the individual are arguably economical.

Additionally, DPFPSH may prove beneficial because of the interactive elements that they can provide. Psychological self-help has been available through books and other reading materials (Ellis, 1993; Forest, 1988). These can provide both self-help

treatments for those suffering from mental distress (Starker, 1988) or to teach resilience to help reduce the onset of mental distress in the future (Skills for Care, 2016). Digital programs can expand on the advantages of these self-help materials with a range of interactive features. They are capable of simulating face-to-face treatment and providing feedback to answers in questionnaires to present resulting diagnoses (Andersson, 2016; Kuhn et al., 2014). Unlike books, they are also able to provide interactive tasks that the users can engage with to help improve their mental state (Donker et al., 2013; Leng et al., 2014). For instance, a study with dementia patients found that iPads were able to facilitate therapeutic tasks while also monitoring and recording mood and wellbeing (Leng et al., 2014). Tasks such as these can be oriented towards the general population, or be tailored more specifically to a given population.

The Smartphone application *PTSD Coach* (Kuhn et al., 2014), designed to help military soldiers with PTSD, contains health and exercise components that can record the user's levels of physical activity. Given that paramedics often find exercise to be a preferred coping mechanism (Porter, 2013) a digital program specific to them could utilise this feature prominently. Additionally, a mobile application designed for those suffering with PTSD would be able to provide helpful information on managing symptoms presented in a more presentational format, can help diagnose and monitor symptoms, provide reminders to do things such as exercise, and create social support networks (Kuhn et al., 2014). Furthermore, DPFPSH have the capability of being updated easily in order to keep in touch with new techniques and information that is being discovered about mental health improvement through these methods. While current DPFPSH do not appear to be using updates to make stark changes to their content, they certainly have the potential to do so, and may do so in the future. Books and reading materials cannot be updated; once they are written and published, the information within them remains the same, which can be a problem if better techniques

are created, or their current information turns out to be unhelpful (Starker, 1988).

Advantages such as these are likely to be useful at least for recording information and providing important reminders, and at best reducing the symptomology of mental distress.

An additional advantage of DPFPSH, especially for paramedics, is the privacy and anonymity they can provide. Haugen et al. (2017) report that stigma is a barrier for first responders to seek mental health care, and many first responders do not pursue this due to concerns of what co-workers and other people may think of them. While support from co-workers and supervisors is an important coping mechanism in paramedics when this is available (Dodd, 2017; Mildenhall, 2012a; Mildenhall, 2012b; Quaile, 2016), unfortunately many paramedics feel that they do not have this support (Haugen et al., 2017). DPFPSH can be an important form of psychological assistance for paramedics. DPFPSH installed on phones allows users to engage with them in public settings wherein they will not stand out and can receive mental health assistance without drawing attention (Kuhn et al., 2014). It may even be possible for paramedics to engage with psychologically helpful DPFPSH on their phone while on duty, but not actively working at that particular moment. Paramedics are known to carry their mobile phones with them at work as a backup in case their radio equipment is not working (Feufel, Lippa & Klein, 2009). Although it would not be allowed for paramedics to use their phones whilst at work, due to practical and professional reasons, it may be possible for them to do so on occasions such as lunch breaks and immediately after finishing work.

4.5 Reported Effectiveness

I have so far argued that DPFPSH have the potential to provide an array of advantages compared to, or supplementary to, other forms of psychological help. Many of which can be specifically advantageous to paramedics as a workforce. However, an

important question remains; do these digital programs actually work in terms of reducing levels of mental distress, through treatment or fostering resilience? It is important to obtain evidence relating to this, especially as some reports suggest that many DPFPSH are not supported by trial-based evidence (Bakker et al., 2016). There are currently two evaluation studies that may help determine this. One is to use psychometric questionnaires to observe if levels of symptomology decreases in research participants who are given access to these programs. The other is to use survey questionnaires to observe if participants actively use the programs, and to see if they personally feel that the programs are helping.

Research for the Smartphone application *PTSD Coach* utilised the latter approach and found that 90% of their sample of veterans considered this to be satisfactory, accessible and helpful (Kuhn et al., 2014). A review by Ruzek and Yeager (2017) concluded that these DPFPSH can be used to improve access to mental health assistance in low and middle-income countries, and they do generally improve wellbeing in the populations provided with them. To further understand the effectiveness of these programs, meta-analyses are important simply because the number of these different programs is very high. According to Zhao, Freeman and Li (2016), the two leading platforms, iOS and Android, contain more than 100,000 health-related applications as of 2014. The following meta-analysis by those authors found that 17 out of 23 research studies on different DPFPSH produced significant results for improving mental wellbeing. Additionally, 19 out of the 23 studies displayed a 65% or greater retention rate, suggesting that participants generally found the DPFPSH to be useful enough to continue using them. It is important for research to continue to keep on track with the use of digital technologies in self-help psychology, especially given how fast they are developing (Zhao, Freeman & Li, 2016). Nevertheless, the relatively early research evidence does indeed suggest that they could be successful.

As well as psychological treatment, it is also important to evaluate if DPFPSH can also be successful for inculcating psychological resilience. In other words: can the technologies support acquisition of resilience to help reduce rates of mental distress in advance of confronting traumatic stressors? Again, the current, relatively limited evidence so far, suggests that this does possess the potential. The pilot study by Wood et al. (2017) tested the *Provider Resilience* application for the capability of reducing burnout on a sample of mental health providers. Their participants showed significantly reduced burnout scores between the baseline scores and after one month. This study however possesses several issues that tend to be typical of studies investigating resilience. Firstly, this study did not possess a control condition, so it is difficult to conclude whether the improvement in burnout scores was due to the *Provider Resilience* application or other factors. A telling aspect is that the participants' resilience scores', as measured by the CD-RISC, did not significantly increase alongside significant reductions in burnout scores. Secondly, the participants were full-time mental health professionals; meaning that they had been exposed to stressful work events prior to the study, and the study was measuring if their burnout scores reduced over time. Therefore, the study was measuring if resilience techniques would act as a treatment of mental distress, rather than prevention of its onset.

Further information about resilience as a mechanism to reduce the onset of mental distress is provided in a meta-analysis by Cleary et al. (2018). Of the 33 studies included in their meta-analysis, four used digital programs to provide the resilience training (Jakel et al., 2016; Klatt et al., 2015; Magtibay et al., 2017; Maunder et al., 2010). Magtibay et al. (2017) used a web-based format of CBT and found significant improvements in both resilience scores and reductions in mental distress after 12 and 24 months. Maunder et al. (2010) also found significant improvements in resilience and reductions in mental distress using a computer-assisted training course. The study by

Klatt et al. (2015) tested a shortened version of the mindfulness-based stress reduction delivered online. They found significant improvements for pre and post scores of mental distress. Their study did, however, not report measures for resilience. Conversely to these study findings, Jakel et al. (2016) found no significant relationship between their experimental and their control group on their measures for resilience and mental distress. Their experimental participants of nurses engaged with the *Provider Resilience* mobile application for 6 weeks. The overall meta-analysis by Cleary et al. (2018) suggests that the potential for resilience to reduce the onset of psychological distress is promising, but more research is needed. The relatively scarce studies provided here may suggest that while digital programs for psychological resilience have the potential to work, the users may need to engage with them for a prolonged length of time. Magtibay et al. (2017) found no significant effect of their digital resilience tool after 8 weeks, but did so after 12 and 24 weeks, similarly to the study by Jakel et al. (2016) who did not find significant effects after 6 weeks.

Other studies suggest that DPFPSH may not be as effective as in-person delivery of resilience training. A meta-analysis by Vanhove et al. (2015) explored the effectiveness of different resilience training programs. These aimed to improve resilience to stress-related conditions in the workplace, and the 37 included studies were on different populations and implemented on different forms of delivery. Four of these 37 studies were computer-based. Their results suggested that resilience training overall has a statistically significant yet modest effect on improving mental health and work performance. However, the four studies using computer-based delivery did not find a statistically significant effect. The authors however do not dismiss the potential of computer-based delivery systems to provide resilience training. They suggest that this approach can be highly efficient in information delivery, and they highlight that other studies in non-workplace settings suggest effective results. Additionally, Vanhove et al.

(2015) suggest that computer-based programs may be more effective on workplace settings if, rather than resilience training, they are focused on stress management interventions. The authors state that stress management interventions, which focus on mitigating the negative effects of chronic stress over time, would be more suited to mental distress related to the workplace. Hence, computer-based programs for workplace mental distress may be improved by using stress management interventions instead of resilience training. Hence, the varying definitions of resilience may influence the effectiveness of DPFPSH.

4.6 Lack of Consensus about the Definition of Resilience

While current reports of the effectiveness of DPFPSH are promising, an issue across these studies is the lack of unified definition of resilience that the subsequent DPFPSH are based upon. One of the conclusions of the meta-analysis by Cleary et al. (2018) is that a universal definition of resilience is needed for both research as well as developing programs aiming to facilitate this. Their review noted that 20 out of 33 included studies directly measured resilience with the remaining 13 studies relying on measures of mental health. Resilience programs that focus on alleviating mental distress rather than fostering resilience to prevent mental distress was a frequent issue. Cleary et al. (2018) further noted that the lack of consensus as to whether resilience is a trait that supports a coping mechanism or a coping mechanism itself is an issue. This is because the success on programs in teaching coping mechanisms and resilience depends on how resilience is defined. This essentially relates to the ‘trait’ vs. ‘process’ debate within the resilience literature (see Chapter 4, Section 4.7.1).

As well as the meta-analysis by Cleary et al. (2018), the lack of consensus over the definition of resilience programs can be observed in individual studies for DPFPSH. Typically, the definition of resilience used by these studies is reflected in the group of

people these are aimed at, and the form of mental distress the DPFPSH aims to address or prevent. For instance, the Provider Resilience mobile application developed by Wood et al. (2017) aimed to help alleviate burnout in mental health providers. Their program aimed to increase resilience and reduce burnout by targeting distress associated with burnout. These include a focus on humour, physical exercise, inspiration and motivation. Similarly, the Pandemic Influenza Stress Vaccine by Maunder et al. (2010) aimed to help provide resilience to hospital staff members who are more vulnerable to stress during influenza outbreaks. Many of the tasks in their resilience program were oriented towards their target population, such as learning to manage work life and home life. Examples such as these demonstrate that the definition of resilience used in DPFPSH is often dependent on both the target population and the related form of mental distress.

4.7 Current Uses of Digital Programs for Psychological Self-Help in Paramedics

DPFPSH therefore can potentially be applied to a range of different populations that are identified as being at higher risk for mental distress, such as paramedics (Alexander & Klein, 2001). The capability of DPFPSH to provide mass-distributed help for mental distress is considered to be an important aspect for the future of paramedics' wellbeing (Dodd, 2017). Hence, there are currently efforts to develop and research the impact of DPFPSH in paramedics. Researchers at the University of Oxford have collaborated with the charity Mind to conduct digital resilience training in paramedics (Mind, 2016; Wild et al., 2018). The RCT aimed to evaluate the ability of the internet-delivered cognitive training for resilience (iCT-R) to reduce mental distress in student paramedics by improving their cognitive mechanisms (Wild et al., 2018). Their study began participant recruitment in October 2017, and is still currently ongoing. The iCT-R

was developed by the researchers, and is only available to the participants of the study at the present via internet access.

Details of the iCT-R are currently only available in a mid-study report (Wild et al., 2018). The iCT-R uses a range of computerised components for delivering the resilience training such as videos, audio files and interactive exercises. These properties of the iCT-R aimed to foster general aspects of resilience, such as concrete thinking and attention training. The iCT-R also aimed to target rumination (repetitive negative thinking), which was previously identified by Shepherd and Wild (2014) as a key aspect of negative appraisals in paramedics that is associated with greater vulnerability to PTSD after traumatic work events. The iCT-R was designed to target rumination with components aiming to teach users to not dwell on negative thoughts or events that cannot be changed and instead focus on more helpful thoughts or present events that could be changed. The ongoing study by Wild et al. (2018) aims to compare the iCT-R with a control intervention (*Mind-Online*) and a standard control (no intervention). Their study plans to test the participants' levels of PTSD using psychometric measures and biological measures. Their results should be published in the future.

The ongoing study by Wild et al. (2018) possesses some similarities to the study I proposed at the beginning of my PhD project in April 2016. A key difference between my study and the study by Wild et al. (2018) is the factors of resilience that are being focused on. Wild et al. (2018) aimed to target mostly general aspects of resilience, with only rumination identified as being more specific to the emergency services (Shepherd & Wild, 2014). My PhD study aimed to investigate further resiliency factors associated with paramedics using a qualitative study of online internet forums where paramedics can discuss their mental distress, coping mechanisms and underlying resiliency factors. The results from this analysis provided a list of different aspects of resilience attributed

to paramedics specifically as a population. This helped to guide development of the STDRT that I tested within the PhD project (see Chapter 6). This was additionally informed by the available research literature on the subject (see Chapter 5).

Another improvement to the iCT-R appears to be accessibility and flexibility in usage. The iCT-R is not publicly available, and the article by Wild et al. (2018) does not make the procedure of using the iCT-R overly clear. However, it appears that the iCT-R consists of six linear modules that are required to be completed in order (Wild et al., 2018). The iCT-R also requires logging into an online intranet. Therefore, this may limit the extent to which this can be used portably. For instance, if a paramedic is feeling distressed at work during a short break, they may not be able to log into the iCT-R in sufficient time, nor navigate to the specific module that may help them in that instance. The development of other digital programs for mental distress in paramedics should aim to make portability and quick accessibility a key aim. This should also aim to make the modules or components flexible and easy to access in any order, as opposed to using a more linear format to make the content easier to find. The development of the STDRT aims to incorporate such usability features (see Chapter 6).

An additional practical reason for the development of the STDRT was due to the inability to access the iCT-R at the present. The iCT-R is currently unavailable to the public and only accessible to the respective researchers and study participants (Wild et al., 2018). Therefore, the iCT-R was not an option available to this study. Therefore, developing an original prototype digital program would help avoid any issues with copyrighted intellectual property or accessibility.

While an alternate digital resilience tool to the iCT-R can be justified, there are aspects of this that can be learnt from and retained in an alternative version. The

definition of resilience that the iCT-R is based on has practical advantages, largely due to this being based on process definitions of resilience.

The lack of consensus of the definition of resilience pertains to whether this is a ‘trait’ concept, or a ‘process’ concept (Wald et al., 2006). Typically, resilience as a ‘trait’ is defined as a fixed, stable component of personality (Windle, 2011), while resilience as a ‘process’ is the dynamic relationship between associated personality traits along with environmental factors, time and circumstances (Wald et al., 2006). In terms of positive psychology, a disadvantage of following a ‘trait’ definition of resilience is that it reduces the capacity for training individuals to improve their resilience (Wald et al., 2006; Windle, 2011). The iCT-R is based on a process definition of resilience that acknowledges that there are some aspects of resiliency that cannot be changed with a digital program, such as psychiatric history, and there are aspects of resiliency that are amenable to change, such as cognitive responses (Wild et al., 2016; Wild et al., 2018). Adopting process definitions of resilience similar to Wild et al. (2018) rather than a trait definition can be beneficial to the development alternative digital programs such as the STDRT.

4.8 Summary of Chapter 4

The increase in the development and availability of DPFPSH reflect an increase in awareness of mental health issues in society. These digital programs possess a number of advantages, such as being more easily obtainable, containing useful digital features and being more readily available at any given time (Donker et al., 2013; Kuhn et al., 2014; Leng et al., 2014; Ruzek & Yeager, 2017). While current research testing their effectiveness appears to be encouraging, more is needed to fully assess their effectiveness and potential drawbacks. Despite their apparent usefulness, a concern with DPFPSH is that their development and use by the general population is increasing at a

greater rate than the research to assess their helpfulness. Research is especially needed for DPFPSH in populations like paramedics, who are identified as being more vulnerable to PTSD.

So far in my thesis, I have provided an account of the history of PTSD as a diagnostic condition, leading into its current application to paramedics. This has then been followed by a review of grey literature, which largely suggests that PTSD and work stress has worsened in paramedics in the UK since 2008. It is apparent that this is due to a combination of economical and sociological changes during this period that have resulted in a reduction of NHS and paramedic resources available, and an increasing OADR. While this would require large changes to paramedic working environments to help improve, I have identified resilience training and DPFPSH as a method that may provide help to paramedics at a more individualistic level. For my thesis, I therefore decided to investigate if a DPFPSH can be used to foster resilience in paramedics, which in turn could help reduce rates of mental distress resulting from work stress and critical incidents. I therefore conducted a narrative literature review to learn more about this area. This also ensured that my project was original, and has not been conducted before. Furthermore, I aimed to develop my own DPFPSH in order to make this more specific to paramedics. The narrative literature review allowed me to look at other DPFPSH published in similar fields to attain approaches and ideas towards developing a DPFPSH. The narrative literature review also allowed me to ascertain factors of resilience and coping in the face of traumatic events from the research literature. This was able to provide me of ideas for content to include in my DPFPSH with the aim to help improve resilience. The next chapter will explain how the literature review was conducted and provide a narrative summary of the literature identified.

CHAPTER 5: A NARRATIVE REVIEW OF THE LITERATURE PERTAINING TO RESILIENCE, OCCUPATIONAL TRAUMA AND DIGITAL INTERVENTIONS

5.1 Introduction

This narrative review of the literature essentially identifies research within three different key strands. These are related to resilience, occupational trauma and PTSD, and digital programs used in health care and psychiatry. The narrative literature review examines how these research strands reveal key knowledge relevant to the proposed project, and how the three separate strands build towards my proposed project aiming to devise a method of using resilience to reduce trauma and PTSD in paramedics.

5.1.1 Aim of the Narrative Literature Review.

There were several aims of this narrative literature review. Some aims were specific to this project, while some were typical of all literature reviews. As with all literature reviews it was important to provide a comprehensive overview and place the given information into perspective (Green, Johnson & Adams, 2006). Other general aims included surveying the state of knowledge pertaining to this area of research and identifying potential problems and issues with research in this area (Baumeister & Leary, 1997; Green, Johnson & Adams, 2006; Noble & Smith, 2018).

It is also important across literature reviews to ensure that a sufficient level of rigour reduces the likelihood of selection bias (Green, Johnson & Adams, 2006). Clear reporting of the review method allows for further replication of the review by other researchers.

Objectives directly related to the current project included a focus on theory evaluation relevant to underpinning ideas and concepts relating to the intended study

(Baumeister & Leary, 1997). This also supports theory development (Baumeister & Leary, 1997). Prior to conducting this study, there were several strands that I needed to learn more about before clear hypotheses could be formulated. The research questions were:

- What is the nature and associated factors of psychological resilience?
- What is the nature of occupational trauma and PTSD in paramedics?
- What features and approaches can DPFPSH possess to be effective?

Therefore, one aim of the narrative literature review was to help formulate more clear theories and hypotheses for the above research questions. The literature was a means of obtaining more information about these given areas of interest (Baumeister & Leary, 1997).

Certain research questions were considered prior to commencing the review.

These included:

- Can psychological resilience be inculcated to reduce mental distress in paramedics in advance of exposure to traumatic events, rather than using treatments after the onset?
- Can DPFPSH be used to support self-taught resilience?

It was therefore important to conduct a literature review to identify and appraise literature relevant to these hypotheses. The narrative literature review aimed to observe how much evidence there was for these hypotheses, and allow the researcher to draw conclusions about the merits of existing relevant conceptualizations (Baumeister & Leary, 1997). If prior evidence supporting the hypotheses was found to be lacking, then an experimental design to test these hypotheses from the ground up would need to be conducted. If there was a modest or reasonable level of evidence supporting these

hypotheses, then this project would be able to build on this current evidence and provide further evidence for the related hypotheses. If there was an abundance of evidence for these hypotheses, then there would be little to be gained from conducting a study to address these already well-supported hypotheses.

5.1.2 Type of Literature Review.

A researcher has several options for systematically approaching the research literature. It is important, therefore, to establish which particular type of literature review is most suitable to specific circumstances/context and to carry out the aims and objectives. Systematic reviews are usually referred to as the ‘gold standard’ of reviews due to their clear and reproducible methods (Noble & Smith, 2018). The conclusions drawn from systematic reviews are considered to be powerful if they obtain a large number of articles with similar hypotheses and produce similar results (Green, Johnson & Adams, 2006). They are additionally ideal when aiming to focus on well-defined question and when an appropriate study design is identified in advance (Arksey & O’Malley, 2005). However, systematic reviews may not be entirely appropriate when theory development is an aim of the literature review or availability of robust empirical studies is limited (Baumeister & Leary, 1997).

The current project aimed to appraise/ select theories relating to the nature and associated factors of psychological resilience. It was important to identify the features and approaches that DPFPSH require to be effective, and also the nature of occupational trauma and PTSD in paramedics. It was decided that a systematic review would not be suitable in this respect. Furthermore, the current study is investigating three different strands, while systematic reviews are most appropriate when focusing on one specific research area (Garg, Hackam & Tonelli, 2008).

Another issue of systematic reviews is that they do not correct and account for issues that were present in the original studies that they included (Garg, Hackam & Tonelli, 2008). A common issue with research into resilience is that studies use resilience as a treatment for those already experiencing mental distress, rather than observing if this can reduce mental distress before the onset (Cleary et al (2018). The aggregated results of a systematic review would most likely include studies that did not use resilience as a preventative measure as opposed to a treatment measure. While ‘studies that used resilience as a treatment measure’ could be used as an exclusion criterion, these studies still provide potentially useful information. This may include the type of resilience training used, how it was provided to the participants or what psychometric measures were used to test the effectiveness. The stringent nature of a systematic review may cause this to either include the inappropriate results of the study into an overall score, or exclude some of the otherwise useful methodology (Garg, Hackam & Tonelli, 2008).

Thus, it was decided that a systematic review was not entirely appropriate for this particular study despite often being referred to as the ‘gold standard’ of literature reviews (Noble & Smith, 2018). Instead, a narrative review was chosen. A narrative review typically describes and appraises articles in a more flexible, yet less focused manner compared to a systematic review (Noble & Smith, 2018). The description of the literature may be a blend of both the literature itself and the author’s interpretation of this whereas a systematic review would solely evaluate findings (Garg, Hackam & Tonelli, 2008).

An additional advantage of narrative reviews is that they can pull together more divergent pieces of information together in a readable format (Baumeister & Leary, 1997; Green, Johnson & Adams, 2006). This feature is useful for a research project that

possesses three different strands referring to resilience, occupational trauma and PTSD, and digital programs used in health care and psychiatry.

Traditionally, narrative reviews contain little description about the methods for selecting articles, and generally lack reproducibility (Noble & Smith, 2018). Arguably the greatest flaw with narrative reviews is a potential for bias (Green, Johnson & Adams, 2006). However, Green, Johnson and Adams (2006) argue that some of these disadvantages of narrative reviews can be alleviated with particular approaches to the literature review. For instance, they state that the author's interpretation and synthesis of the literature should acknowledge and account for major differences between studies, such as sample sizes or differing research designs. Additionally, Green, Johnson and Adams (2006) advise authors using narrative reviews to aim towards presenting objective conclusions based upon the literature, rather than presenting an opinion-based argument based on a myriad of references. While a narrative review technique was chosen, I aimed to nevertheless conduct this as objectively as possible, to comment on any major differences in the methodology of the individual studies, and to distinguish between objective conclusions and opinions.

5.1.3 Search Strategy.

A filtering strategy was adopted using key words of the research proposal to find relevant articles within the three main strands. This was done using a range of electronic resources and journal articles (see Table 5.1). Additionally, no date restrictions were used. While obtaining many articles is ideal in terms of allowing progress in the academic field (Webster & Watson, 2002), the filtering strategy was important in ensuring all articles were relevant to the project.

It was also decided that the current narrative literature review would include other literature reviews such as systematic reviews and meta-analyses. There are several

advantages to be gained from reading and including other literature reviews within a narrative review. One purpose of a literature review is to create an ideal starting point for other researchers to obtain information about a given topic (Paré, Trudel, Jaana & Kitsiou, 2015). The inclusion of other literature reviews would allow me to obtain information around the subject as a whole, rather than separate points on a subject. Another advantage was to gain further insight into the underlying theories relating to the current topics such as paramedics, PTSD and resilience. It is possible that authors of literature reviews may find novel findings from the original compiled studies due to accessing a wider breadth of information. It is therefore important to include literature reviews within this narrative review to ensure any relevant novel ideas generated by the respective researchers are not missed. See Table 5.1 for the literature sources searched.

Table 5.1

Literature sources searched

Databases (15)	'Discovery' (@UCLan); Google Scholar; PsycINFO; PsycARTICLES; PubMed; EBSC; CINAHL Complete; Scopus; MEDLINE; ERIC; NCBI; Taylor and Francis Online; Wiley Online Library; British Library Electronic Thesis Online Service EThOS); UNISON.
Journals (25)	Behavioural and Cognitive Psychotherapy; Traumatology; International Journal of Occupational Medicine & Environmental Health; Psychological Medicine; Journal of Paramedic Practice; Emergency Medicine Journal; British Journal of Psychiatry; Trauma, Violence & Abuse; Journal of Personality and Social Psychology; Studia Psychologica; International Journal of Occupational Medicine and Environmental Health; European Journal of Psychotraumatology; Journal of Affective Disorders; International Emergency Nursing; American Psychologist; Neurobiology of Stress; Behavioural and Brain Sciences; Journal of Consulting and Clinical Psychology; BMC Emergency Medicine; International Journal of Emergency Mental Health; Mindfulness; Military Medicine; Computers in Human Behaviour; BMC Medical Informatics and Decision Making;

As the project investigates the role of resilience in reducing trauma and PTSD, the first key word used in the filtering strategy was ‘resilience’. Other sub-key words were later included to further filter the articles (see Table 5.2).

Table 5.2

Filtering search results for ‘resilience’ and related sub-key words

<u>Key Words Searched</u>	<u>Results</u>
Resilience	216,565
Resilience + Paramedics	104
Resilience + Cognitive + Paramedics	9
Resilience + Trauma	11,125
Resilience + Cognitive + Trauma	841
Resilience + PTSD	5,756
Resilience + Cognitive + PTSD	544
Resilience + Trauma + PTSD	3,163
Resilience + Cognitive + Trauma + PTSD	302
Resilience + Occupational Trauma	350
Resilience + Cognitive + Occupational Trauma	11
Resilience + Mobile Application	692
Resilience +	19

Cognitive + Mobile Application	
Resilience + Computer + Online	601
Resilience + Cognitive + Computer + Online	16
Resilience + Self-help	323
Resilience + Cognitive + Self-help	61
Resilience + Trauma + Self-help + Paramedic	0

As seen in Table 5.2, the lone term ‘resilience’ produced a relatively high number of research articles. However, this became substantially fewer as sub-key terms were included in order to filter the search and make it more relevant to the current project, especially when the term ‘cognitive’ was also included in order to help ensure that the term ‘resilience’ referred to a psychiatric/psychological context. Additionally, there were no articles found relating to ‘resilience’, ‘trauma’, ‘self-help’ and ‘paramedic’. This suggests that while a substantial level of research literature has been undertaken for resilience in a variety of fields, there have been considerably fewer aspects of the literature applying resilience to paramedics, occupational trauma, self-help, and digital programs. Within this literature search, twenty articles were read and selected to be included in the review in order to provide insight and information relating to resilience in the current context.

One of the other three key aspects of the current research project is ‘trauma’. Similarly to ‘resilience’, a search of this key term was conducted along with related sub-key words (see Table 5.3). While ‘PTSD’ was included as a sub-key term, ‘trauma’ was chosen as the primary key term in this search in order to cover a larger spectrum of

trauma symptomology, as well as articles relating to the experience of traumatic events without the onset of any psychiatric disorders.

Table 5.3

Filtering search results for 'trauma' and related sub-key words

Trauma	968,953
Trauma +	57,087
PTSD	
Trauma +	1,992
Paramedic	
Trauma +	70
PTSD + Paramedic	
Trauma +	14
PTSD + Mobile Application	
Trauma +	59
PTSD + Computer + Online	
Trauma +	207
PTSD + Self-help	

Trauma is understandably a vastly researched field in general, with the search producing 968,953 articles for the term 'trauma' alone. However, many of these referred to physical injuries. Similarly to 'resilience', the search results became fewer as sub-key words were included to make the results more relevant to the current field. These sub-key words helped the search to become specific to psychological trauma. A wide array of articles were found relating to traumatology in paramedics, flaws in the structure of the practice that contributes to this, and therapies aimed to help alleviate this. Few of these were related directly to pre-anticipatory resilience and therapy through digital programs.

The final main search was performed on the key term 'digital' (see Table 5.4). As the alone term 'digital' would most likely produce a vast amount of articles

unrelated to the current context, this term was not entered in the search alone. Instead the sub-key words were always included in order to keep the search results related to the current project.

Table 5.4

Filtering search results for 'digital' combined with related sub-key words

Digital + Self-help	1,001
Digital + Self-help + NHS	4
Digital + Self-help + Paramedic	0
Digital + Self-help + Trauma	8
Digital + Self-help + Resilience	3
Digital + Self-help + Cognitive resilience	0

In order to ensure that the articles from the literature search were relevant, an inclusion/exclusion criterion was established (see Table 5.5). In total 41 articles were selected for the literature review. Like the initial filtered search, these are essentially divided into the three categories; resilience, occupational trauma and PTSD, and digital programs and self-help. The summary of the review will syntactically link the three strands together in order to help form a foundation for the current research project.

Table 5.5*Inclusion and exclusion criteria*

Inclusion Criteria	Exclusion Criteria
Relating to PTSD	Not published in English
Relating to trauma	
Relating to resilience in a psychological context	
Relating to the paramedic profession	
Relating to occupational stress and distress	
Relating to digital programs for alleviating distress	
Relating to psychological self-help	
Qualitative and quantitative	
Meta-analysis	
Literature review	
Published in English	
Studies from any geographical location	

5.2 Occupational Trauma and PTSD

Whilst working in healthcare professions is known to be stressful, research in the last several decades has shown that the prevalence and severity of this is greater than perhaps previously thought. A comprehensive survey investigation, as well as literature reviews and meta-analyses, by UNISON (2013) discussed the issues currently faced by NHS staff members. The article also provides a wide range of statistics related to the rates of sickness absence and occupational burn-out in order to demonstrate the detrimental effects of this. The article also outlined that paramedics tend to suffer from the highest rates of physiological and psychological disorders as a result of their work. For example, paramedics are reported to possess a higher rate of PTSD than the general

population; approximately 20% compared to the general rate of 3%. Furthermore, paramedics had the highest rate of sickness absence between 2012 and 2013 compared to other NHS employees. They also experienced long-term problems which resulted in early retirement; they had a greater rate of heart disease and higher standardised mortality rates compared to both the general population and other public service professions. The PTSD rate of 20%, while notably high, is not as high as many researchers would anticipate (Streb, Hällner & Michael, 2014). UNISON acknowledges this and states that this may be due to self-report bias caused by a perceived 'macho' culture within the service, as well as research only including current workers and not retired workers. However, another explanation for this may be due to resilience factors and psychological preparedness (Streb, Hällner & Michael, 2014). While the comprehensive work by UNISON provides a wide range of statistics as well as several qualitative quotes from service workers, the article does not offer much in terms of methods to help alleviate the problems that it outlines.

Other studies have also examined the prevalence of trauma and PTSD in paramedics. Alexander and Klein (2001) used questionnaires to specifically measure psychopathology and personality influences in a large sample of 160 paramedics from the Scottish Ambulance Service. The study found that paramedics suffer from an alarmingly prevalent rate of trauma-related symptoms. 82% of the participants had experienced a traumatic event in the last six months, approximately 30% of participants reported PTSD symptomology and 32% of participants reported high burn-out rates. Statistics such as these help to further contextualise the issues facing paramedics due to the nature of their work. Furthermore, the article then briefly discusses factors that influence individual differences in the onset of trauma symptomology in paramedics. These include both personality factors such as hardiness and experience, and external factors such as support and preparation/training. For instance, correlations between the

questionnaires for personality and psychopathology suggested that a 'hardy' personality was associated with lower rates of burnout. Interestingly, the questionnaires report that 38% and 36% of the paramedics felt that better training and better pre-incident briefing respectively would have helped to cope better with critical incidents. The conclusions of the article do not suggest that this idea should be explored further. One aim of my thesis was to explore the potential of improving pre-incident support for paramedics using resilience training.

Additionally, different types of traumatic work experiences have also been investigated. Regehr, Goldberg and Hughes (2002) used mixed-methods research to report the experiences that paramedics find the most distressing. The death of a child was rated as the most traumatic experience for paramedics, with 84.9% of the sample being exposed to this and 78% experiencing subsequent distress. The researchers identified six other critical incidents that are associated with distress in paramedics (see Table 5.6). The manifestation of the mental distress as a result of the critical incidents may differ depending on the type of critical incidents the paramedics are exposed to, as well as the intensity of a given event.

Since Alexander and Klein in 2001, research in this area has placed more emphasis on exploring the individual differences and causal factors in the onset of trauma and PTSD in paramedics. For instance, Kirby, Shakespeare-Finch and Palk (2011) used questionnaires to measure post-traumatic growth (PTG) after a traumatic event in paramedics. As well as retrospectively measuring PTG, the coping strategies adopted were also recorded via the questionnaires. These coping strategies were divided into adaptive and maladaptive strategies. For example, positive coping strategies were self-help and approaching others, while maladaptive strategies included self-punishment and avoidance. The study found that adaptive coping strategies were associated with

positive PTG, while maladaptive coping strategies were associated with poorer PTG, and an increase in PTSD-related symptoms. The study had several flaws, such as requiring participants to retrospectively recall their trauma growth, rather than being able to measure this longitudinally. However, the study importantly demonstrates that as well as external factors and personality factors, the actions of the paramedics in response to traumatic events are important in the onset and degree of PTSD. Any training related to this area should therefore also aim to encourage participants to adopt adaptive coping strategies such as the ones identified in this study, while also avoiding maladaptive strategies.

Individual differences between paramedics have also been further investigated to observe if they mediate the onset of mental distress. Regehr, Goldberg and Hughes (2002) further looked at the coping strategies that their sample of paramedics used through qualitative analysis. There appears to be a range of different coping mechanism depending on individual differences. For instance, one paramedic in their qualitative analysis reported that with suicides, they need to obtain as much information about the situation as they can in order to help provide a sense of closure. Another participant reported family support as their way of dealing with traumatic work incidents. One common factor the study reported was that emotional distancing resulted in problems with personal relationships and a worsening of symptoms in the long-term. Therefore, the coping strategies of paramedics can be either helpful or unhelpful. Some strategies are associated with improvements in mental health, while others are associated with a worsening in mental health.

Table 5.6*Exposure to Critical Events*

Type of exposure	Paramedics exposed (%)	Paramedics exposed who experienced distress (%)
Death of a patient	84.9	35.6
Line-of-duty death	27.9	58.3
Violence against self	69.8	30.0
Near-death experiences	55.8	48.0
Death of a child	84.9	78.0
Multiple casualties	90.7	33.3

Note. Reproduced from Regehr, Goldberg and Hughes (2002).

Coping strategies have been further explored in a literature review performed by Mildenhall (2012a). Based on 11 previous studies, the author used thematic analysis to identify a range of coping strategies as well as the apparent effectiveness of these. Similarly to Alexander and Klein (2001), she found evidence that some coping strategies were associated with long-term positive PTG, such as support and reflection. Conversely, negative coping strategies associated with short-term positive growth, but long-term PTSD symptomology were also identified, such as emotional suppression and risky behaviours such as alcohol consumption. This narrative literature review further highlights the need to ensure that paramedics are trained to engage in the appropriate coping strategies in order to help avoid the onset of PTSD. While strategies such as seeking support are something that can only be done after a traumatic event, training paramedics to feel comfortable with seeking social support is something that may be accomplished beforehand, especially as masculinity-related pride is often a barrier in doing this (Haugen et al., 2017; Quaile, 2016; Sarmány-Schuller, 2011).

Cognitive thinking styles have been further investigated with regards to the onset of trauma in paramedics. Research by Shepherd and Wild (2014) investigated how the onset of trauma symptomology can be affected by how paramedics think about traumatic events. Their study took a sample of 45 paramedics and administered three questionnaires measuring PTSD and a written description of two difficult emergency calls; one where they felt that they coped well, and one where they felt like they did not. They additionally rated each of these call outs based on thirteen cognitive appraisals. Seven of these were positive and six were negative. An example of a positive appraisal was 'I imagined the event getting better', and an example of a negative appraisal was 'I continually thought about how terrible it was'. The study found that participants who made more positive appraisals were less susceptible to PTSD than those who made more negative appraisals. The study had several methodological flaws. For example, the severity of the traumatic events was not controlled across the participants. Therefore, this may have acted as a mediating variable, as more severe PTSD and more negative appraisals may have been mediated by the severity of the emergency case described. Nevertheless, the study provided groundwork which suggests that the cognitive process of the individual is important in influencing the likelihood of trauma-related symptoms. Pre-trauma training may therefore focus on training an individual to adopt positive-oriented appraisals in order to help reduce PTSD.

5.3 Resilience

Another important strand of the current research is the notion of resilience. Despite research into resilience being undertaken as far back as the 1970s, there is little consensus on an exact definition of resilience. This is likely due to the fact that researchers see 'resilience' as a culmination of a wide range of personality factors, such as optimism and problem-solving capacity, rather than an independent construct. This

therefore makes it open to different interpretations depending on what measures are used in a given study. For example, Reivich, Seligman and McBride (2011) define resilience as ‘a set of processes that enables good outcomes in spite of serious threats’ with application to their research into resiliency and US army soldiers. The ‘set of processes’ are described as mental factors such as ‘sense of meaning’ and ‘cognitive flexibility’. However, in their research into the neural plasticity relating to resilience, McEwan, Gray and Nasca (2015) state that experiences throughout life help and overcoming prior adversity build resilience. Hence resiliency should not be defined as a static concept, as the plastic brain is not static. This comparison between the two different research articles helps demonstrate an issue with definitions of resilience being different across different studies. Indeed, Agaibi and Wilson (2005) claim that their model of PTSD onset was hindered by the lack of consensus on a definition of resilience.

While the definition of resilience is not particularly standardised, research in a wide range of areas has adopted the basic concept of resilience, and studied it within a particular area. Most of the applied research in this area was first done as part of the Penn Resiliency Program (PRP); a large-scale training program designed to foster resilience in school children (Reivich, Seligman & McBride, 2011). Empirical results related to this have suggested that the PRP has not been particularly powerful or fully effective. A meta-analysis of 17 studies found lower self-reported depressive symptoms post-test (Brunwasser, Gillham & Kim, 2009). However, the effect sizes were low and improvement was found predominantly in children identified at high risk for depression to begin with. A controlled trial in 2014 found similar results with the additional issue of lacking long-term effectiveness, with an improvement in depression scores not found after a two-year follow-up (Challen, Machin & Gillham, 2014). While the results of these studies are not particularly encouraging, it should be noted that the studies were at

their most effective in children at high risk for depression. Therefore, studies in this area may be more promising when performed on a group of individuals at high risk for psychiatric illnesses, such as paramedics, and not including a low-risk group that creates an overall floor effect.

An extension of the PRP has been undertaken within the US military, known as the Comprehensive Soldier Fitness (CSF) programme. This is a \$125-million training program implemented in 2009 (Steenkamp, Nash & Litz, 2013). Despite the large-scale investment into the project, there has been relatively little empirical research into this particular area. This is most likely due to the difficulty with intervening within the military's own routines, making it difficult to isolate extraneous variables and prevent interactions between experimental groups and control groups (Cacioppo et al., 2015). Nevertheless, the limited research in the area still provides useful insight. Reivich, Seligman and McBride (2011) provide a detailed outline of what the CSF consists of, as well as a preliminary self-report feedback from soldiers who received this training. Feedback was mostly positive, with an average of approximately 4.8 out of 5 on most areas. Additionally, a more empirical investigation was carried out by Cacioppo et al. (2015). An RCT over 3000 participants into either resilience training or cultural awareness training (control). The results indicated that while cultural awareness training decreased prejudice towards Afghans, the resilience training showed a small yet significant improvement in social cognition as well as decreased loneliness. While the effect size was not particularly large with regards to the improvement in social cognition, this can still result in notable benefits overall when applied to a large number of individuals (Fishbein, 1996). A further issue with the study is that the results do not generalise outside of the training foci, and no long-term measures were taken after the soldiers entered combat. Additionally, while four different military units were used comprising of soldiers with potentially different levels of combat experience, the results

were not split between these different participant types. Therefore, the study was not able to measure if the effect size was affected by how stressful the soldiers' regiment was to begin with.

More recently, resilience techniques have been attempted and studied in healthcare professions. Healthcare professionals are known to suffer from high rates of stress-related mental distress due to the nature of the job (Palm, Polusny & Follette, 2004; Sorenson, Bolick, Wright & Hamilton, 2016; UNISON, 2013). For example, between 2012 and 2013 nurses, midwives and health visiting staff in the UK lost 953,250 days to stress-related illnesses such as anxiety, stress and depression; more than any other type of sickness (UNISON, 2013). Therefore, investigations into the potential for cognitive resiliency in this area have been explored.

One pilot study using a sample of 21 nurses identified at being high risk for PTSD found significant decreases in burnout scores between pre-test and post-test (Craigie et al., 2016). However, the study faced a number of limitations, including several issues similar to that of the PRP and CSF. For instance, the participants were only followed as far as one month; hence the long-term effectiveness was not measured.

Additionally, secondary traumatic stress (STS), general resilience and anxiety did not show a significant improvement. This was most likely due to a floor effect, with many participants not exhibiting these symptoms at high enough levels to begin with. Anxiety for instance had a score as low as 1.90 averaged across all participants at pre-test, thus was only reduced to 1.50 at follow-up. Furthermore, a fundamental flaw with this study, like many resilience studies, is that it aims to measure the reduction in trauma symptomology that is high to begin, rather than measuring how resilience prevents an increase in these symptoms. Therefore, this study effectively measures treatment of trauma symptomology, rather than resilience and prevention. The same

issue is additionally found in studies such as Streb, Haller and Michael (2014), and Zamirinejad et al. (2014).

Paramedics are an important participatory group in this area, as research suggests that paramedics possess levels of PTSD comparable with soldiers (Fjeldheim et al., 2014; Thomas et al., 2010) and research using this participatory group may be less likely to encounter floor effects; a problem often encountered with other participatory groups (Craigie et al., 2016).

A number of researchers have used questionnaire studies to correlate resilience and its related components with PTSD. Using this technique Fjeldheim et al. (2014) found an association between greater PTSD and lower levels of resilience. Likewise, Gayton and Lovell (2012) showed that professional experience in paramedics was associated with resilience, and in turn resilience was associated with general health and well-being. Furthermore, these types of studies have investigated the sub-components that relate to resilience. Questionnaire research by Ogniska-Bulik and Koblyarczyk (2015) suggested that positive PTG was associated with helpful coping strategies as well as resilience. Similar research methods by Streb, Haller and Michael (2014) used a multiple regression model to suggest that sense of coherence (SOC) was an influential mediating factor between resilience and protection against PTSD. Furthermore, Austin, Pathak and Thompson (2018) found that resilience in paramedics was negatively correlated with secondary traumatic stress and negative changes in outlook. However, resilience also appeared to reduce with experience in the job, making the paramedics more vulnerable to the negative effects of secondary stress. This highlights how resilience in paramedics may not be a fixed construct entirely dependent on individual differences, and may instead possess a dynamic relationship with the paramedics' external environment.

A flaw with questionnaire studies is that the participants' trauma-related self-evaluations are often retrospective, and may not be completely accurate (Southwick, Morgan, Nicalaou & Charney, 1997). Additionally, retrospective questionnaire studies make it difficult to determine the causality of variables (Barnett & Hyman, 2006). Therefore, it is possible that trauma-related psychopathology leads to resilience once recovered (described as PTG), rather than resilience preventing trauma-related psychopathology.

However, using different methodologies can overcome a number of issues often found in questionnaire research. Wild et al. (2016) used a longitudinal methodology design in order to measure PTSD and perceived resilience in student paramedics during their first week of training, and continued to do so every four months for two years. Multiple regression analysis showed that participants who developed greater levels of PTSD also tended to show lower levels of resilience and related factors (such as high neuroticism and low social support) at the start of the study. Therefore, the study suggests that those vulnerable to developing PTSD and related psychopathology were identifiable prior to paramedic work, and resilience training may be useful in aiding the reduction of this. The use of a longitudinal methodology was therefore useful in helping to learn more about the causality of resilience and PTSD in paramedics.

Researchers have used techniques other than questionnaires in order to learn more about this field. Clompus and Albarran (2015) used qualitative interviews with seven paramedics in order to obtain information about the sub-components of resilience used specifically in this population. The qualitative data suggested that as well as a large number of sub-components, the main four components contributing to resilience in paramedics are motivation to be a paramedic, external workload pressures, coping mechanisms and external support. The use of a different type of data gathering helps to

point out an important aspect of this area; while questionnaire studies are mainly focused on the psychological aspects of resilience, this study suggests that environmental aspects such as social support and pressures in the workplace are also important factors. It could therefore be proposed that resilience can be divided into two related components. One proposed component is internal resilience, which related to buffers for PTSD that are formed within the individual's own cognitions. The other proposed component is external resilience, which relates to buffers for PTSD that are formed from the individual's environment, societal attributes and relationships with others.

While a lack of a unified definition means that it is difficult to fully support this idea (Agaibi & Wilson, 2005), previous studies suggest that a distinction between internal and external resilience can be made (Liu, Reed, & Girard, 2017; Mandleco, 2000; Meltzer, 2004). Internal factors comprise of personality and cognitive factors such as optimism, locus of control, or emotional regulation. External factors consist of factors that reside in the individual's environment, such as social support, economic opportunity and education.

5.3.1 Internal and External Resilience.

The factors of internal resilience vary across studies using different methodologies and populations (Lamp, 2013). It can therefore be difficult to determine the core factors of internal resilience. For instance, the literature by Iacoviello and Charney (2014) suggests that optimism is a primary factor of resilience. However, other research suggests that optimism can be further divided into sub-factors. Research into resilience training in schools provides further insight. Noble and McGrath's (2007) research into the positive education practices framework suggest that optimistic thinking in students is associated with celebrating their strengths and achievements. Similarly,

Rosen's (2010) study of law students highlights how optimistic thinking for resilience can be cultivated by the use of positive language and outlook. This example suggests that internal factors of resilience may not necessarily be fixed components, and may have other correlated components or possess their own sub-factors.

External factors of resilience possess a different aetiology depending on the population in question; hence paramedics are also subject to this distinction. The research literature suggests that paramedics often view their relationship with their colleagues as an important external factor of resilience (Mildenhall, 2012a). This appears to be due to the fact that paramedics believe that people outside of their community would find it difficult to relate to their experiences and also their coping mechanisms, such as the use of 'black humour' (Christopher, 2015). It is not clear what researchers are capable of doing to help foster the improvement of external resilience within the paramedic's community. Jackson (2011) believes that the external factors of resilience cannot be influenced by researchers directly. However, researchers and organisational bodies, according to Jackson (2011), can help provide support for paramedics and improve their capacity to foster external resilience by improving services and infrastructure to make their jobs easier. In this theory, once the paramedics are able to perform their work to the best of their ability, their external buffers to resilience will improve alongside this. Some researchers hypothesise that social support is the best predictor for resilience in the face of traumatic events in paramedics (Kleim & Westphal, 2011).

The distinction between internal and external factors of resilience does not always appear to be a neat divide. Some identified traits of resilience may possess aspects related to both internal and external factors. One example of this is the proposed trait 'moral compass.' Iacoviello and Charney (2014) state that a moral compass is made

up of core beliefs, such as altruism, that help retain a positive outlook about oneself and one's role in the world in the face of negative life events. They additionally state that the moral compass trait can be attributed to religion and spirituality. These can be viewed as external factors of resilience, in that religion often centres on a community and often provides opportunities for asking others about an understanding of life and personal meaning in relation to traumatic situations. The moral compass trait is therefore an example of inter-relationship between internal and external resilience factors that is sometimes observed; and some resilience traits do not always fit into one form or the other.

While the STDRT (see Chapter 6) incorporates social support to an extent, the program was mainly focused on providing information and tasks focused more on the internal factors. This was because internal factors can theoretically be taught using computer aided therapies. For instance, optimistic thinking may be taught and fostered, whereas economic opportunity cannot be done so. External factors of resilience would ideally be improved by structural changes to the Ambulance Service such as better organisation between managers, unions and staff, debriefing, and promoting a culture of mutual support (Dodd, 2017; Mildenhall, 2012a; Mildenhall 2012b; Quaile, 2016). Some facets of external factors of resilience were incorporated into the STDRT, such as the Supportive Social Network section. However, due to the functionality of the STDRT, more features were inevitably focused on internal factors of resilience. Information provided from this narrative literature review was used to help develop the pre-trauma training content used in the STDRT (see Chapter 6).

5.4 Digital Programs for Psychological Self-Help

Providing psychological therapy through self-help manuals has shown promising results in terms of both alleviating psychiatric illnesses (Gould, & Clum,

1993; Schotanus-Dijkstra et al., 2015) and teaching resilience to help prevent psychiatric illnesses (Cavanagh, Strauss, Forder & Jones, 2014; McCann, Songprakun & Stephenson, 2016). Additionally, self-help therapies have recently been presented using digital formats in order to make them more easily accessible and to perform virtual tasks that cannot be done with paper and pen (Merry et al., 2012). However, they may also contain certain disadvantages compared to more traditional therapy methods. For instance, while Luik et al. (2016) found significant reductions in anxiety and depression scores in participants using digital CBT, they also found a high drop-out rate of participants (27%) and cited a lack of a control group as an issue. Therefore, it seems possible that these issues are common across most studies using digital self-help techniques. A lack of a control group is likely to be a common problem because digital self-help therapies are a new technique, so similar but different digital self-help programs that could be used as a control are scarce. Also, high drop-out rates may be commonplace if another person is not there to help encourage the participant to continue the therapy, unlike more traditional face-to-face therapies.

The digital program by Kuhn et al. (2014) investigated the potential of using this method to help alleviate trauma and PTSD symptoms by devising a digital App capable of providing self-help methods to veterans suffering from PTSD as well as being able to monitor symptoms over time. An initial feasibility study suggested that participants found it fairly easy to use, even without experience using Smartphones. Subsequent follow-up studies found reductions in PTSD symptoms in these participants (Miner et al., 2016; Possemato et al., 2016). These studies did, however, report modest effect sizes and symptom reductions were greater when the participants were additionally supported by a clinician. Nevertheless, these studies suggest that there is potential for digital programs to be both effective and efficient in therapies for PTSD.

5.5 Summary of the Narrative Literature Review

This chapter has presented the literature search strategy and has narratively reviewed literature related to three separate strands important to the current project: occupational trauma and PTSD, resilience, and digital programs and self-help. Recent digital programs have shown potential to help deliver self-help therapy due to their ability to present virtual tasks, store feedback data and be easily distributed. While there is currently the potential issue of high drop-out rates and a lack of a control therapy (Luik et al., 2016) studies so far show some promise in aiding the reduction of psychiatric/psychological symptoms (Kuhn et al., 2014; Milner et al., 2016; Possemato et al., 2016). While most research so far suggests that the effect sizes of these studies are fairly low, it can still have a notable social and economic effect overall if applied to a large number of people (Cacioppo et al., 2015; Fishbein, 1996).

Digital programs have been used increasingly in the past few years to provide self-help therapy to those suffering from psychiatric disorders, yet they have not yet used self-taught resilience programs in order to try and prevent and reduce the onset of psychiatric/psychological disorders. Administering face-to-face resilience therapy to all members of a vulnerable organisation, e.g. an entire unit of paramedics, would be expensive due to the costs of utilising relatively well-paid therapists. Digital programs however offer the potential to be cost-effective in administering resilience training to a large amount of individuals. Research has suggested that the psychological concept of resilience is influential in aiding the prevention of psychiatric illnesses in paramedics. Questionnaire studies find that PTSD is more prevalent in paramedics with lower levels of resilience (Fjeldheim et al., 2014; Gayton & Lovell, 2012; Ogniska-Bulik & Koblyarczyk, 2015; Streb, Haller & Michael, 2014). Qualitative research and longitudinal studies support this finding (Clompus & Albarran, 2015; Wild et al., 2016).

Unlike soldiers and school student there has yet to be an investigation into providing resilience training in this particularly vulnerable population.

Paramedics are especially vulnerable to PTSD due to the nature of their work (Palm, Polusny & Follette, 2004; Sorenson, Bolick, Wright & Hamilton, 2016; UNISON, 2013). This occupational group appear to possess the highest sickness absence rates and the earliest retirement rates across NHS employees (Alexander & Klein, 2001; UNISON, 2013). While changes to their work environment are probably needed, studies have shown that the cognitive styles and thinking patterns of paramedics can also influence their likelihood of experiencing PTSD after a traumatic experience or frequent encounters with traumatic experiences (Kirby, Shakespeare-Finch & Palk, 2011; Mildenhall, 2012a; Shepard & Wild, 2013). Using resilience training to target these cognitive styles in paramedics may help reduce psychiatric disorders and mental distress such as PTSD and burnout. Thus, this may in turn help to reduce sickness absence and early retirement rates. May

The purpose of this narrative literature review was to ensure that this project has not been conducted before by other researchers, to assess what the literature has contributed so far, and to identify gaps in the research. However, this narrative literature review itself provides an important contribution to the research area. The current subject of using digital programs to increase resilience in paramedics is a novel area in which no researcher has done a finished investigation, with one other ongoing investigation (Wild et al., 2018). This narrative literature review therefore is a novel review by bringing together the three different strands of occupational trauma in paramedics, resilience, and digital programs. This provides a narrative overview which outlines the possibility of using digital technologies to increase resilience in paramedics, in turn

reducing the likelihood of the development of PTSD. I am committed to writing an extension of this review as a peer-reviewed article for potential publication.

To conclude, occupational trauma and PTSD is a prevalent problem in paramedics due to the nature of their work. This has a detrimental effect on both the mental health of individuals and their respective organisations, such as the NHS. Research suggests that resilience plays a prominent role in aiding the prevention or reduction of PTSD in paramedics. Research further suggests that resilience may be trained in paramedics in order to help further reduce symptomology across individuals. More recent research demonstrates the potential for digital programs to provide self-help therapy. This could potentially be used to help teach resilience in paramedics.

5.5.1 Incorporating Identified Resilience Factors from the Narrative Literature Review into the Self-Taught Digital Resilience Training.

While this narrative literature review was conducted to identify a gap in the research literature, justify my research aims and objectives, and ensure that this had not been done before, this also allowed the identification of resilience factors within the research literature. From reading these, this provided the facets of psychological resilience that I could incorporate into the STDRT, aiming to foster resilience.

The review of facets for resilience by Iacoviello and Charney (2014) provided an ideal starting point for this objective. Their review looked at research on resilience in a variety of populations, such as military veterans, disaster survivors, refugees and victims of sexual assault (although not populations with experience to secondary or vicarious trauma, such as first responders and paramedics). From their review, they propose that the psychosocial factors of resilience are: optimism, cognitive flexibility, active coping skills, physical health, social support network and personal moral compass. While the review by Iacoviello and Charney (2014) provided a starting point

to incorporate factors of resilience into the STDRT, my narrative literature review highlighted other research literature adding to this. Additionally, my narrative literature review investigated trauma and PTSD more specifically in paramedics in order to further ensure that the development of the STDRT remains focused on fostering resilience specifically in this workforce. The contribution of the narrative literature review in designing and developing the STDRT will be outlined in Chapter 6.

5.6 Conclusion of the Narrative Literature Review

In this chapter I have outlined the processes taken in a systematic search and review of literature. I have additionally presented the relevant literature selected in a table format. Finally, I have presented a narrative review of the obtained literature. The 41 papers identified were sub-divided into three categories. This resulted in nine articles relating to occupational trauma and PTSD, 25 articles relating to resilience, and seven articles relating to digital programs and self-help. Of these, the articles most relevant were outlined and discussed in terms of their empirical strengths, weaknesses and how they syntactically related to each other.

The purpose of my narrative literature review was to identify a gap in the literature that I could then research within. I identified that paramedics were a workforce more vulnerable to work stress and trauma compared to the general population that have been under-researched in this area. I identified training to foster resilience as a method that may help reduce PTSD in advance of critical incidents, and also for digital programs as a new method of providing help with mental distress. This narrative literature review was influential in developing my project aims and hypotheses pertaining to using digital programs to increase resilience in paramedics. The lack of previous research in this area suggested that it would be an original and interesting project that had the potential to benefit paramedics.

I therefore aimed to develop a digital program designed to help foster resilience in paramedics, named in abbreviation as the STDRT. Following this narrative literature review, I hypothesised that resilience may not be a fixed mental construct, but a dynamic fluid construct that varies across individuals and populations. I therefore aimed to develop the STDRT to foster resilience specific to paramedics as a population. To determine what factors of resilience were more specific to paramedics, I was able to ascertain part of this from the narrative literature review itself. As my narrative literature review identified previous research on resilience in paramedics, similar populations (e.g. military) and the general population, this was able to directly inform me of resilience factors to include in the STDRT. This helped me to develop a first version of the STDRT, which is outlined and explained in the next chapter.

CHAPTER 6: DESIGNING THE SELF-TAUGHT DIGITAL RESILIENCE TRAINING

6.1 Introduction

In this chapter, I will outline the initial steps that were taken to develop the STDRT that was used to administer the self-taught training to foster resilience in the feasibility study (see Chapter 7, Section 7.12). The initial stage of this process involved using the information obtained from the narrative literature review (see Chapter 5) to identify resilience factors that could be integrated into the STDRT. Once an initial preliminary version of the STDRT was developed solely from the narrative literature review, this was developed and updated further drawing upon findings from the online forum study (see Chapter 8, Sections 8.1 to 8.2). Therefore, while the first prototype of the STDRT was mostly created using ideas from the literature, ideas from the online forum research were included in an updated version. The resultant program being essentially a prototype in a preliminary stage of design and testing. Thus, the first version of the STDRT was developed before the online forum study, and the second version was developed subsequently from the online forum study. This chapter will first outline how the first prototype was created using the narrative literature review. Then, this chapter will outline how the second prototype was developed using the online forum study. While this may diverge from the chronological order by which this project was conducted, I decided to account for the full development of the STDRT in total within a single chapter here to improve the rationale and flow of the thesis.

6.2 Development of the Self-Taught Digital Resilience Training, Part 1

The information regarding resilience to traumatising experiences generated from researching journal articles was incorporated into the STDRT. This prototype version was built using Microsoft PowerPoint. The program was run using the slideshow mode,

with icons and text being hyperlinked in order to guide users through the program.

There were two main components of this. One component provided background information on the nature of a paramedics' job, and how certain circumstances may lead to stress and trauma symptomology. The other was the main component, which largely consisted of the resilience intervention. This component provided general information on trauma, PTSD and its prevalence in the paramedic service in order to help further provide context and raise awareness of the issue for users who may not be as familiar in the area. This section also contained information and tasks aimed to help foster development in four key areas of internal resilience; cognitive flexibility, optimism, coping skills and moral compass. Additionally, social support was included as an external factor of resilience. These factors were identified by Iacoviello and Charney (2014) and elaborated upon using further research articles from the narrative literature review. Exercise and physical wellbeing were additionally identified by Iacoviello and Charney (2014). I chose not to include this in the first version of the STDRT, as I thought at this time that this external factor would be too difficult to incorporate into the STDRT. However, the results of the online forum study (see Chapter 8, Sections 8.1 to 8.2) highlighted how exercise and physical wellbeing was particularly important in alleviating mental distress in paramedics, especially given the often physical nature of their work. Therefore, I included exercise in the second version of the STDRT (see Section 6.5.3 in this chapter). Each of these areas contained their own sections providing information and tasks.

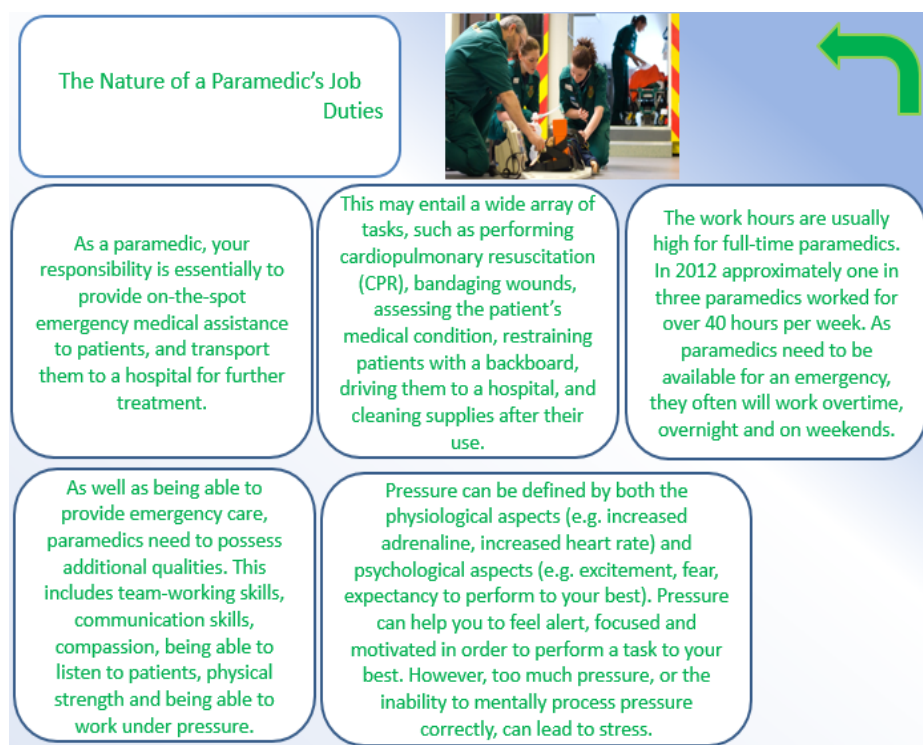
6.2.1 Outline of a Paramedic's Profession.

Before the STDRT could provide information on topics such as work trauma, PTSD and resilience in paramedics, it was important for this to give a summary of a paramedics' profession. A summary of their profession would help those engaging with

the STDRT understand why work stress and PTSD can be experienced from working as a paramedic. A section for this content was therefore provided. This included information relating to their job description, work hours and required skills. This section further provided an outline of the work pressures that paramedics face, and how this may lead to trauma symptomology if prolonged or experienced at intense levels. Information about paramedic’s job requirements was obtained using NHS websites (NHS, 2017a) and guidebooks on working as a paramedic (Caroline, Elling & Smith, 2011; McMunn, 2009). Information about how their work experiences may lead to mental distress such as PTSD, depression or burnout were derived from the research articles and reports exploring mental distress in paramedics (Alexander & Klein, 2001; Regehr, Goldberg & Hughes, 2002; UNISON, 2009). Figure 6.1 provides a screenshot of this part of the STDRT in edit mode, providing information about the nature of a paramedics’ work. Animations are used to help break down the text and make it more readable.

Figure 6.1

A screenshot of the STDRT

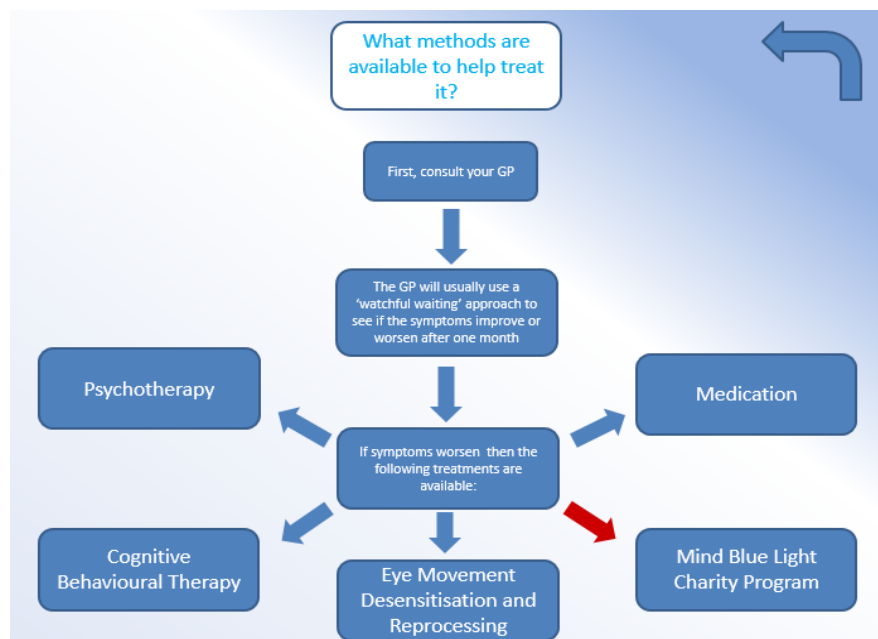


6.2.2 Information about Occupational Trauma.

The STDRT provided background information on occupation trauma. This provided five sub-sections to help break down the information: ‘What is Occupational Trauma?’, ‘What are the Symptoms and Severity?’, ‘What is the Prevalence in Paramedics?’, ‘What Methods are Available to Help Treat it?’, and ‘What Methods are Available to Help Prevent it?.’ Figure 6.2 provides a flow diagram of how help and support for occupational trauma and PTSD is usually obtained. The icons for each of the five therapies contain links providing information for each of them. This section also contained an interaction model to help further explain this area using visual diagrams. To provide general information and an overview about PTSD, information from the NHS website (NHS, 2017b) and the NICE guidelines (NICE, 2018) were used. Information from the narrative literature review was also used to provide estimates for the prevalence in paramedics. As studies appear to show mixed numbers, a broad estimation was provided of 15%-25% in paramedics (Alexander & Klein, 2001; Petrie et al., 2018; UNISON, 2009).

Figure 6.2

A screenshot of the STDRT in edit mode



6.2.3 *Optimism.*

Optimism was presented as a section of the STDRT, as research has shown that positive thinking and optimistic outlooks after emotionally traumatic events is associated with reduced likelihood of trauma symptomology (Iacoviello & Charney, 2014; Kleiman et al., 2017; Riolli, Savicki & Cepani, 2002). As well as general information on optimism, this section also provided information on five identified sub-components of optimism, and two tasks designed to foster optimistic thinking. The narrative literature review suggested that optimism was not a unidimensional phenomenon, but possessed several sub-factors and correlated factors. The studies identified were conducted on several different population groups.

Studies on students identified proposed sub-components of optimism. Celebrating strengths and achievements was identified as being an important aspect of optimistic thinking in Noble and McGrath's (2010) research on the positive education practices framework. Students who engaged their strengths and displaying a natural capacity for behaving and thinking in a manner that promoted successful goal achievement were shown to possess greater resilience and wellbeing. This may be applicable to paramedics; as they help the injured and save lives for their job, a focus on this in the form of celebrating strengths and achievements may provide an increase in resilience.

Other studies into resilience using students provide insight into the components that make up optimism. Positive language and outlook were cited as a component of optimism that helps improve academic performance and wellbeing in a study on law students by Rosen (2010). In her study, she found that when professors give feedback written in more optimistic language that encourage perseverance to obtain improved or correct answers as opposed to more critical feedback, the students showed greater

improvement in later scores, and reduced levels of depression. While this study demonstrates the beneficial effect of positive language in improving resilience, this is not limited to academic feedback. It is possible to teach individuals to think more positively across different situations. Many forms of CBT aim to teach positive thinking to replace identified faulty negative thoughts (Brewin, 2006). Thus, the use of positive language as a component of optimism may be integrated into the STDRT.

As well as students, research on other population groups highlights the different components of optimism as a factor of resilience. A highlighted component relates to managing objectives that are under one's control. Studies on those with physical illness have provided further insight into this. Aspinwall and MacNamara's (2005) evidence review relating to cancer patients and resilience highlights the importance of optimistic and positive thoughts in improving their reported quality of life. Their review highlights how in tasks involving non-hypothetical risks, those with greater optimism scores more rapidly disengage from initial problems that could not be solved and focused on those that they could solve. The authors suggest that a controlled optimism is most helpful, wherein the optimistic thinking is directed towards problems that can be solved, while also knowing when to move on from problems they cannot solve. Similarly, a study by Sturgeon and Zautra (2010) finds that an important aspect of resilience in those suffering from chronic pain is not only an optimistic outlook on their life, but also a willingness to accept pain and its consequences while also directing their attention to ways that the pain can be at least managed. This helps not only with the physiological symptoms of pain, but also improves psychological wellbeing. These studies show that an important aspect of optimism is allocating optimistic thinking strategies to manageable problems rather than unsolvable problems.

Further studies and literature reviews on other populations highlight the different components associated with optimism as a factor of resilience. The review by Grant and Kinman (2014) focused on resilience in healthcare workers. They cite that an important aspect of resilience in healthcare workers is optimism that the patients they treat will improve. This form of optimism however is related to empathy, as the healthcare workers are required to consider the perspectives of their patients as well as their own perspectives. It is therefore important for healthcare workers to be optimistic about their patients as well as themselves. This focus of optimism outside of oneself can also be applied to paramedics. As paramedics treat others in their work, their resilience may improve if they possess an appropriate level of optimism for their patient's wellbeing as well as their own performance.

Therefore, four sub-components produced from the narrative literature review were classified as 'Celebrate your Strengths', 'Manage or Ignore What you Cannot Change', 'Adapt your Language and Outlook', and 'Focus Outside Yourself'. An additional sub-factor, 'Cultivate Spontaneity' was developed from the online forum study (see Chapter 7). These all contained written information explaining each sub-component, and how one may apply these to oneself. The tasks included the 'Visualisation Optimism Task' and the 'Flowchart of Optimistic Thought Task'. The 'Visualisation Optimism Task' required the user to take 15 minutes to visualise the best possible circumstances in their future and write these ideas down. The effectiveness of this task is supported by empirical research (Hanssen et al., 2013; Meevissen, Peters & Alberts, 2011). The 'Flowchart of Optimistic Thought Task' presents participants with a number of flowchart icons with scenarios and responses written within them, and participants had to arrange these as a flowchart twice. On their first attempt they were required to use arrange the flowchart icons in a manner that comes naturally to them. On the second attempt they were required to do this while thinking as optimistically as

possible. Unlike the ‘Visualisation Optimism Task’, the ‘Flowchart of Optimistic Thought Task’ is a novel task devised by myself drawn from the ideas and theories from the reviewed research articles. Thus, there is not currently any available research evaluating the effectiveness of this.

6.2.4 Coping Skills.

The section on coping skills presented information and tasks related to specific techniques that may be self-taught and used to help alleviate stress. The background information provides guidance on how coping skills may be used, how they help, and how negative coping mechanisms, such as drugs, do not help in the long term. Research literature helped to formulate this section. Kirby, Shakespeare-Finch and Palk (2011) used a questionnaire study on paramedics to obtain adaptive and maladaptive coping mechanisms. Their work discusses the idea of PTG as a belief in learning and taking positive changes from traumatic situations, which is suggested to be an adaptive mechanism in paramedics. Both their background to the subject and their research results suggests that a belief in PTG has mixed effects in serving as a coping mechanism in paramedics. The STDRT hence provided a section explaining the concept of PTG, but acknowledged that due to individual differences this may not work for everyone. This version of the STDRT did not possess any information about the use of avoidance as a coping skill, as the study by Kirby, Shakespeare-Finch and Palk (2011) as well as other literature cited within their study (Robinson, 2002; Shakespeare-Finch, Smith & Obst, 2002; Zuckerman & Gagne, 2003) suggested mixed reports of this being adaptive or maladaptive.

A cross-sectional study by Streb, Haller and Michael (2013) suggests that while resilience in paramedics is associated with lower PTSD, a sense of coherence account for most of the variance. A sense of coherence in their study is defined as a dynamic

feeling of confidence in coping with stressful life challenges (Streb, Haller & Michael, 2013). Given that paramedic students undergo training in their courses to prepare for helping those in accidents, the coping skills section in the STDRT used written text to reassure paramedics that their training is there to ensure that they can cope in pressured situations.

As well as using written information to highlight the positive effect of having a sense of coherence, I also aimed to incorporate tasks to help foster coping skills associated with resilience. The narrative literature review identified associations between mindfulness and resilience (Bajaj & Pande, 2016; Thompson, Arnkoff & Glass, 2011). Meditation as a coping skill to alleviate stress and allow one to process stressful and traumatic events more clearly was a key skill used in these mindfulness studies. Studies in paramedics have suggested that this is beneficial to building resilience for this workforce. This effect was identified in intervention studies (Chopko, Papazoglou & Schwartz, 2018; Kaplan et al., 2017) and interview studies on paramedics (Shakespeare-Finch & Savill, 2013). I therefore aimed to incorporate a task on teaching paramedics to engage in mindfulness and meditation into the STDRT.

However, a meditation task would take quite a while for paramedics to complete, and would be expected to be done across a number of occasions (Bajaj & Pande, 2016; Thompson, Arnkoff & Glass, 2011). Therefore, I aimed to also include a task that could similarly facilitate a helpful coping skill that could be done more quickly. The narrative literature review identified controlled and rhythmic breathing as a helpful coping task, with studies on military veterans (Morie, Chance & Buckwalter, 2011) and on police officers (Andersen et al., 2015). The narrative literature review pertaining to DPFPSH also found that breathing exercises were incorporated into digital

apps that were shown to be beneficial in alleviating stress (Chittaro & Siono, 2014; Kuhn et al., 2014).

The tasks in this section provided guidance on diaphragmatic meditation and breathing. ‘The Meditation Task was a six-step tutorial on meditating while focusing on thoughts and breathing. This included guided animations and illustrations. ‘The Breathing Task’ used an expanding and contracting animated circle with audio instructions to guide inhaling and exhaling in a controlled and rhythmic manner. This task is similar to that in the prototype apps developed by Chittaro and Siono (2014).

6.2.5 Moral Compass.

Research into resilience identified in the narrative literature review suggests that possessing a personal moral compass is an underlying factor (Iacoviello & Charney, 2014; Leontopoulou, 2010; Southwick, Vythilingam, & Charney, 2005). This is due to a number of reasons, such as providing a sense of meaning, attributing meaning to traumatic events and providing a community. Thus, the STDRT provides information in this section on what a ‘moral compass’ is, why it is important, and a brief outline on the research linking a moral compass with resilience. In terms of a related task, this proved to be difficult to incorporate in the digital program. Some researchers believe that a moral compass is formed by the time trainees have entered their medical-related profession (Culver et al., 1985). Other researchers believe that while a moral compass may be taught, it is largely dependent on the work environment (Swenson & Rothstein, 1996). For instance, the term ‘ethical erosion’ is used to describe the decline in the moral obligation of medical students due to being surrounded by the lack of ethical upholding by senior medical staff.

Thus, the research literature is mixed on whether a moral compass can be fostered, or can only be innate, and research further suggests that this may erode over

time spent working in professions that require compassion towards others frequently. Being able to talk to other paramedics to obtain guidance and help with issues such as ethical erosion is suggested to be helpful. My narrative literature review for this thesis identified several articles that help to elaborate this area. A literature review by Mildenhall (2012a) discusses how paramedics are often keen to receive support from supervisors and senior members, but often find that they can be unsupportive and even contribute to this ethical erosion. Additionally, Quaile (2016) highlights how work environments where senior members help to tackle stigma surrounding mental health can have beneficial effects on the wellbeing of their paramedic staff, and those who reinforce the stigma create negative effects. Mildenhall (2012b) also discusses that the increase in paramedics' work schedules makes it more difficult for paramedics to seek help from other paramedics, especially from more senior staff members. My idea for a task to help foster the moral compass component of resilience involved replicating the help and advice that a paramedic may receive from an older, more experienced paramedic.

The importance of guidance and help from a more experienced paramedic was also observed in the online forum study (see Chapter 6, Section 6.5.4). Therefore, 'The Moral Compass Task' within the STDRT focused on using senior paramedic figures to provide a positive example of retaining a moral compass in the workplace. The task displayed a video of a retired paramedic discussing his experiences with trauma, PTSD and the positivity of helping others for a living. The task required the users to write down three things that the video taught them about possessing some form of a moral compass. While a digital program is limited in terms of building a moral compass, the video task aims to simulate an ethically positive environment created by a senior paramedic.

6.2.6 Supportive Social Network.

Research suggests that external factors of resilience are important in reducing the likelihood of trauma-related psychopathology, particularly social support from family members, colleagues and friends (Fjeldheim et al., 2014; Kirby, Shakespeare-Finch & Palk, 2011; Mildenhall, 2012a; Wild et al., 2016). Similarly to the acquisition of a moral compass, this section proved difficult to accommodate within a digital program, as a supportive social network is something largely associated with the external environment. Nevertheless, I aimed to incorporate this within the digital program as suitably as possible. Similarly with all other sections, the program contained written information regarding how a supportive social network is important for a paramedic and how it relates to resilience. Furthermore, while there was no task for this section unlike the other sections, the section did have a link to a page that provided contact details for wellbeing services at the University of Central Lancashire (UCLan), as well as external online services such as Samaritans and *It's Good to Talk*.

6.2.7 Cognitive Flexibility.

Cognitive flexibility was identified by Iacoviello and Charney (2014) as being a factor of resilience in their review. They define this as the reappraisal of situations and experiences to find meanings and positive outcomes, as opposed to remaining rigid and focused on negative outcomes. However, they do not provide many sources for how they derived at cognitive flexibility being a factor of resilience, and their definition and justifications of this are similar to optimism. Nevertheless, they do highlight the importance of cognitions in resilience and positive thinking. I therefore aimed to foster flexible cognitions and positive cognitions within the STDRT.

The written part of the section uses similar language to CBT and discusses how being open to other process of thinking can help one to think more positively and

realistically about their problems (Hofmann, 2011), and to not focus overly on negative thinking patterns. This section also contained a ‘Wisconsin Card-Sorting Task’ in order to provide an artificial example of how fixating on one thinking strategy prevents solutions to problems from being attained. Research by Deveney and Deldin (2006) suggests that those with major depressive disorder (MDD) score lower in this task. Their results suggested that this effect was not due to decreased task engagement, suggesting that greater cognitive flexibility may be associated with greater protection from MDD (though the direction of this causation cannot be completely determined). The ‘Wisconsin Card-Sorting Task’ was therefore included to help foster cognitive flexibility in paramedics using the STDRT. Furthermore, a section was included on explaining how the mechanisms underlying cognitive flexibility are related to resilience, and how to apply these to the everyday world. This section was included to help counterbalance the artificialness and possibly perceived unrelatedness of the ‘Wisconsin Card-Sorting Task’.

6.3 Feedback and Improving on the First Prototype

In order to obtain a preliminary measure of the efficacy of the first prototype of the STDRT, a study was done in collaboration with the NWAS. The study aimed to distribute the version of the STDRT devised up to this point to paramedics and obtain feedback on its perceived effectiveness in helping to reduce mental distress, as well as how easy the program is to use and navigate.

6.3.1 Method.

NWAS were contacted about the study and asked for their willingness to be involved. External ethical approval was obtained from NWAS on 28/03/17 (NWAS 2016_2017 146) and internal ethical approval from the university ethics committee was obtained on 08/05/17 (STEMH 546). Following this, a page on the NWAS intranet

learning zone (see Figure 6.4) was created containing information about the study, the consent form, the STDRT available to download, and a feedback sheet for this study (see Appendix 3). This feedback sheet contained both related questions on a five-point Likert scale, and open-ended questions that allowed the participants to provide qualitative feedback.

6.3.2 *Participants.*

Participants in this study were essentially members of NWAS who had access to their learning zone intranet. Ideally paramedics or related emergency service workers such as EMTs were desired for this study, but any related professional with access to the NWAS learning zone were welcome to participate if they wished.

6.3.3 *Results.*

Only one individual agreed to participate in this particular study. While this meant that the variety of views and opinions desired was not fulfilled, it still provided important information into the appropriateness of the STDRT for paramedics, and the efficacy of the program itself. Since there was only one participant in this study, it was not appropriate to display any personal details such as the age of the participant. Information about the participant that helps validate their opinions and responses to the feedback sheet can be provided. The participant classed their job title as ‘paramedic’ with five years of experience and they viewed the STDRT on a computer as opposed to a portable device. The participant’s responses to the feedback questionnaire can be viewed in Figures 6.5 and 6.6.

Figure 6.4

A screenshot of the NWS intranet learning zone

NWS Learning Zone
Online Learning and Information Centre

NHS
North West
Ambulance Service
NHS Trust

Research Project - Kamran Baqai

A research project is being carried out in order to make a digital program that can provide self-taught resilience training. This may help to reduce burnout, stress and occupational trauma in paramedics.

We would appreciate your help in providing feedback on a prototype of a digital program created by researchers at the University of Central Lancashire. Your participation thus only requires experimenting with this digital program, and completing a two page feedback sheet. You are welcome to participate if you have any type of paramedic role of any seniority.

If you are interested in participating please read the [Participant Information Sheet](#) for more information.

Having read the information provided, if you wish to take part in the research project, you should follow the following steps:

- 1: Download, read and sign the [Consent Form](#)(Word Document)
- 2: Download and browse through the [digital program](#). The program is created using Microsoft PowerPoint. No software is installed on your computer but does require Microsoft PowerPoint to be installed on the computer you are using.
- 3: Once you have fully explored the digital programme, download, read and complete the [feedback sheet](#)(Word Document).

Having completed your investigation of the digital program, please return your completed and signed consent form and feedback sheet to : KBaqai@uclan.ac.uk.

PDF Document Version

If you do not have Microsoft Word on your computer you can download the [Consent Form](#) and [Feedback Sheet](#) in pdf format by clicking these links.

© North West Ambulance Service NHS Trust Trust Website: www.nwas.nhs.uk

Figure 6.5

The participants' response to the feedback sheet

	I completely agree	I agree	I am not sure	I disagree	I completely disagree
The program was easy to use	X				
The program ran smoothly with no glitches	X				
The content in the program was interesting and insightful		X			
The content in the program has the potential to improve my resilience to occupational stress and trauma		X			
The tasks in the program were helpful in raising my understanding of occupation trauma, stress and resilience		X			
I believe that the program would be beneficial for paramedics at the start of their career	X				
I believe that the program would be beneficial for paramedics years into their careers already		X			

Figure 6.6

The participants' response to the feedback sheet

I think the best parts of the program are:

The best part for the program for me was explanation of whole process with medical terms, not with popular psychology terms, if it will be pointed on paramedics that kind of explanation will probably appeal to them better, cause they will be able to understand what physically is happening in our body when we are traumatised. Also movies attachments were interesting break from reading, especially one with speech from experienced paramedics.

I think the program could improve by:

I'm happy with the content of the program but if it will be possible maybe the power point presentation could be transformed into mobile phone app, cause this way paramedics could easily and quick come back to the part of program they would feel the need to reverse even on a shift.

Any additional opinions and views:

It will be nice if in the end will be list of sources used in constructing this program and web pages that could be visited to read more (I saw one web page about mindfulness, maybe you are aware of more useful links, in this case it may be useful) .

But really great job, hopefully after study is finished program can be successfully introduced for all paramedics ☺

The responses to the Likert scale questions were all in the 'I agree' or 'I completely agree' range. The use of biological terminology as opposed to psychological was cited as one of the best parts of the program. A recommended improvement was to have the program in a mobile application rather than PowerPoint so it could remember where the user was up to when opening it again. Furthermore, additional views provided

were to include a reference list in the STDRT. Additionally, the respondent also showed interest in mindfulness.

6.3.4 Discussion.

A disappointing aspect of this study was that only one participant was recruited through the NWS. Participant recruitment and drop out are general concerns with internet research (Hoerger, 2010). This could be explained variously, such as reflecting how busy paramedics are, or the lack of engagement with the learning zone for non-mandatory updates. The impact of only having one participant in this study must be considered. The greatest concern with this is that the feedback from this one participant cannot be generalised towards the STDRT. It is unknown if other paramedics would have noted similar points, or noted entirely different aspects of the STDRT, and no statistical parameters can be obtained (Creative Research Systems, 2003). I therefore took caution with applying the findings from this study to the STDRT, but I nevertheless used it as a general guide, a source of reassurance, and an opportunity to amend obvious mistakes made the first time that the participant noted.

The feedback obtained from the participant was encouraging. As the Likert scale responses were all in the 'I agree' or 'I completely agree' range, it provided confidence that the STDRT was succeeding in its usability and in being tailored towards paramedics.

The open-ended questions were additionally encouraging. The use of biological terminology as opposed to psychological was singled out as being a strength of the STDRT. This aspect was derived from the online forum research (see Chapter 7) rather than the narrative literature review, so this response in particular helped to further vindicate the online forum research.

Additionally, while there was a welcome embrace of biological terminology, the respondent also showed interest in mindfulness. This may suggest that the interest in biological approaches does not necessarily preclude attention to psychological approaches. With more participants, it may have been possible that a broader range of preferences would have been observed, since the STDRT does include both biological and psychological approaches. This may suggest that different demographics would have different affinities for the varying aspects of the STDRT. A follow-up study with a larger sample size would be required to investigate this further.

One of the recommended improvements was to have the program in a more powerful application than PowerPoint so it could remember where the user was up to when opening it again. This can potentially be done in the future after the current project, if the prototype moves onto a complete version. Furthermore, it was stated that a reference section for the STDRT would be beneficial. This has been included in the second version of the prototype.

6.3.5 *Summary of Feedback Study.*

Despite disappointments with the participant response rates, the feedback provided by the one participant was encouraging. It provided confirmation that decisions about language use, such as containing more physiological than psychological, were welcomed, and the presentation techniques, such as videos, were also successful ideas. The qualitative feedback provided also highlighted how paramedics may use this during their shifts, as well as before and after. This provided useful insights into how paramedics may actually use the STDRT while working; an interesting finding given that the STDRT was primarily designed for the feasibility study with paramedics in training.

6.4 Summary of the Development of the Self-Taught Digital Resilience

Training: Part 1

The steps taken to include the content designed to foster resilience in paramedics in the first version of the STDRT has been outlined in the first part of this chapter. While the STDRT allows flexibility with which order the content is viewed in, I have highlighted the first thing for users of the STDRT to view is an outline of a paramedic's profession, what type of work pressures they face, and how this can sometimes become stresses and trauma. The STDRT then allows flexibility in accessing sections on different factors of resilience identified in the narrative literature review. As well as presenting written information on these factors, I also developed interactive tasks designed to help foster these aspects of resilience. A study to help obtain feedback on this first version of the STDRT was undermined by a small sample size. The feedback from the one participant was encouraging and reassured me that I was approaching the development of the STDRT in the right way.

Following the development of the first version of the STDRT, I conducted the online forum study (see Chapter 7 for full exposition of the online study) in order to ascertain factors of resilience more specific to paramedics. Once this study was completed, I used the qualitative data to include other sections on fostering resilience in a second version of the STDRT. In the next section, I will outline how the online forum research contributed to the development of the second version of the STDRT.

6.5 Designing the Self-Taught Digital Resilience Training Part 2

The online forum study proved to be an interesting and original aspect of this project. This generated a lot of useful information. Some of this was completely novel, while some conformed with previous research. This information helped to provide insight and ideas that could then be further included into the STDRT. This chapter will

outline the design refinements to the STDRT resulting from the information generated in the online forum study.

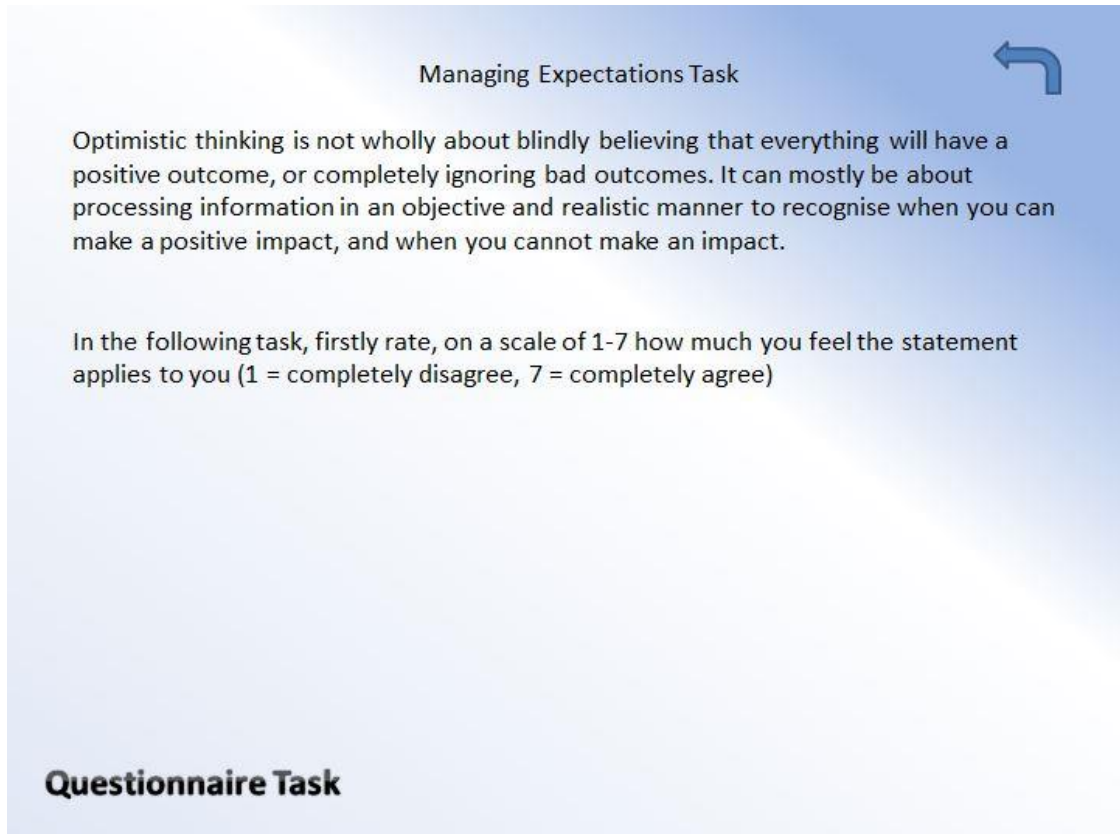
6.5.1 Managing Expectations.

The cognitive strategy to manage expectations was a frequently observed aspect in the online forum study, congruent with previous research findings on burnout, despite little or no apparent links in PTSD specifically. The decision was made to create a task related to managing expectations in the STDRT. This is because recent PTSD classifications have included symptomology caused by chronic stressors (Cloitre et al., 2013; Lanius et al., 2010; Pai, Suris & North, 2017).

The task was based on the forum posts related to managing expectations and realistic expectations, as well as research literature outlining the role of expectations and burnout (Browning et al., 2006; Lamb, 2009; Porter & Johnson, 2008; Swetz et al., 2009). It may seem contradictory that some psychological literature suggests that optimism and a high locus of control are associated with resilience (Hand, 2004), while the reported research suggests that unrealistic expectations about an ideal future may result in mental distress in the long-term. More research is required to fully understand this possible contradiction, whether it is mediated by individual differences or time. Currently, it seems that the best approach is a balance between optimism and determination without this being unrealistic. Thus, this was outlined at the beginning of the managing expectations task in the STDRT in order to not confuse users.

Figure 6.7

Screenshot of the STDRT for the Managing Expectation Introduction




The task that was created for managing expectations was an original idea named ‘The Questionnaire Task’. Figure 6.7 provides a screenshot of this. The first stage of this task presented the users with statements relating to paramedic work expectations. Some were based specifically on their profession, such as “There is always something I can do to help patients”. Some were more general, such as “Success is the binary opposite of failure”. These statements contained a Likert scale ranging from 1 to 7 (1 = completely disagree, 7 = completely agree). Figure 6.8 provides a screenshot of some of these questions. The users were asked to rate each statement for how much they agreed with it. The second stage of the task required the users to read some included forum posts from the online forum study (see Figure 6.9). The information in the post was

from paramedics and former paramedics discussing about the control they had in their work, the lack of control, and the mental strategies to help others. The third stage of the task required the users to repeat stage 1 and see if any of their scores have changed due to stage 2. The overall idea of the task was to help paramedics think about how realistic their thoughts are by comparing them before and after reading about the experiences of veteran paramedics. Since this is a novel task, follow-up research should test if this task specifically has an effect on resilience and mental health.

Figure 6.8


Screenshot of the STDRT for the Managing Expectation questionnaire task

Task Questions:



1 = completely disagree 7 = completely agree

1: I feel like I am in complete control of every situation I encounter.	1	2	3	4	5	6	7
2: There is always something I can do to help patients.	1	2	3	4	5	6	7
3: I do not need to dwell on past cases, as I always feel that I did all that I can.	1	2	3	4	5	6	7
4: If I work hard enough, then my job will always have a successful outcome.	1	2	3	4	5	6	7



Right click, select 'Pointer Options', use pen or highlighter to mark numbers
To re-use the arrow cursor, right click, select 'Pointer Options', select 'Arrow'.

Figure 6.9

Screenshot of the STDRT for the Managing Expectation questionnaire task



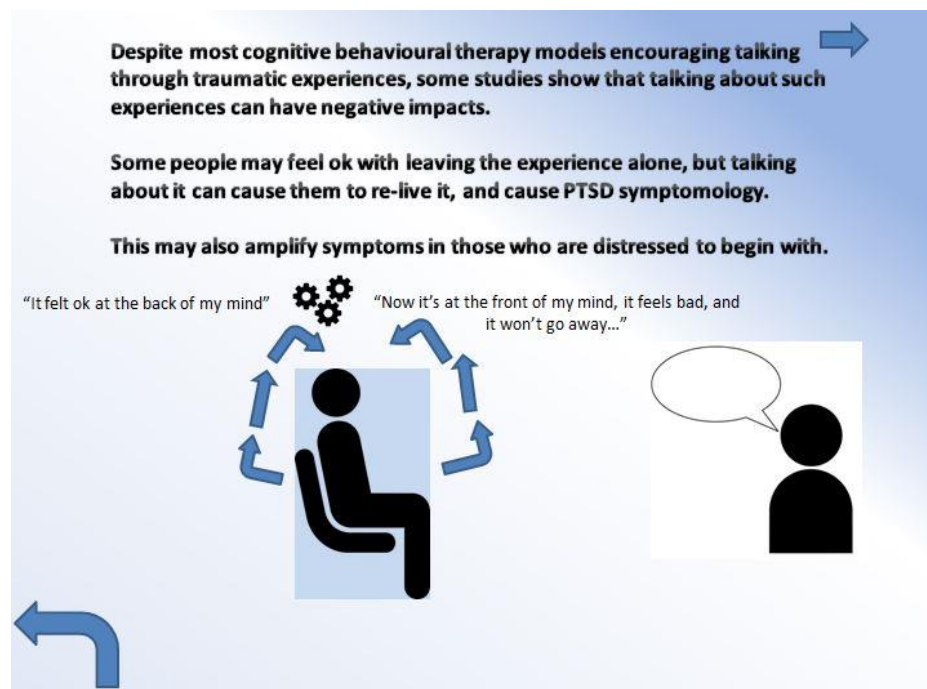
6.5.2 When to Talk about Trauma.

Another key observation from the online forum research was that not all paramedics find talking about their traumatic work experiences helpful. Some seem to find that this worsens their wellbeing, or initiates decline in their wellbeing when they were fine previously. This finding supports previous research. Studies have suggested that CISD may vary in effectiveness depending on factors such as individual differences (Moran, 1998), the time lapse it is administered after the critical incident (Campfield & Mills, 2001), whether CISD was administered individually or in groups (Hawker, Durkin & Hawker, 2011), or whether it was compulsory or voluntary (Hokanson & Wirth, 2000). Further research is needed to explore this. Currently, the best policy

appears to be allowing paramedics and other emergency workers to talk about traumatic events only if they want to and are comfortable with doing so.

Figure 6.10

Screenshot of the STDRT for the When to Talk about Trauma section



The STDRT therefore incorporated the idea that paramedics should be advised to only discuss traumatic work events if they feel comfortable, rather than being pressured into doing so. Therefore, a section in the STDRT was made to briefly summarise the conflicting research on this subject. This outlined how talking about work trauma may be beneficial, such as ‘feeling that you are not alone’, or detrimental, such as ‘re-processing and re-living the traumatic experiences’. Animations were used to help emphasise the point and make them more memorable (see Figure 6.10).

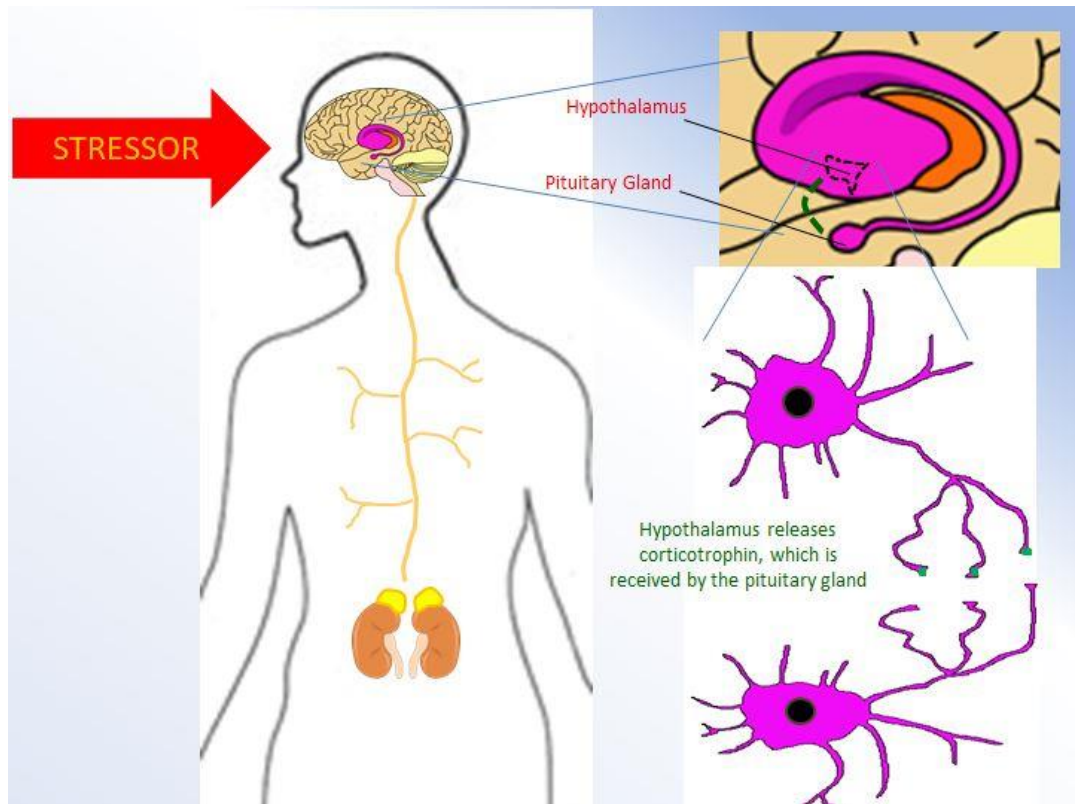
6.5.3 Biological Approaches and Exercise.

The findings from the online forum study further suggested that many paramedics seem to prefer using biological explanations of mental distress rather than psychological. Therefore, biological terminology and explanations for mental distress, treatment and resilience options were seeded throughout the STDRT. For instance, the list of possible methods to treat PTSD included biological treatments such as medication. Additionally, paramedics frequently cited exercise as a helpful coping mechanism. This appeared to tie in with the overall idea that biological/physiological approaches may be a helpful way to make it better for paramedics engaging with the STDRT. Therefore, a section about exercise and how this helps was additionally included into the STDRT. Like most aspects that involve the external environment, this was a difficult component to incorporate. This was because the STDRT obviously cannot do the exercise for individuals, and the software used for this prototype is not capable of recording data such as steps taken per week or calories burned in order to contend with most fitness mobile applications. Therefore, the exercise section relied mostly on information provision.

In order to further help make the STDRT more engaging for paramedics, a section was made providing a biological explanation of PTSD using visual animations (see Figure 6.11). The informational content from this was derived from the research article by Head, Singh and Bugg (2012). Using animations, this section outlined how external stressors trigger biological mechanisms to respond accordingly, and how PTSD as a disorder that creates chronic activation of these biological mechanisms results in biological deficits. Furthermore, the section highlights how exercise can be used to help alleviate and reverse the damage caused by PTSD.

Figure 6.11

Screenshot of the STDRT for the Biological Explanation of PTSD section



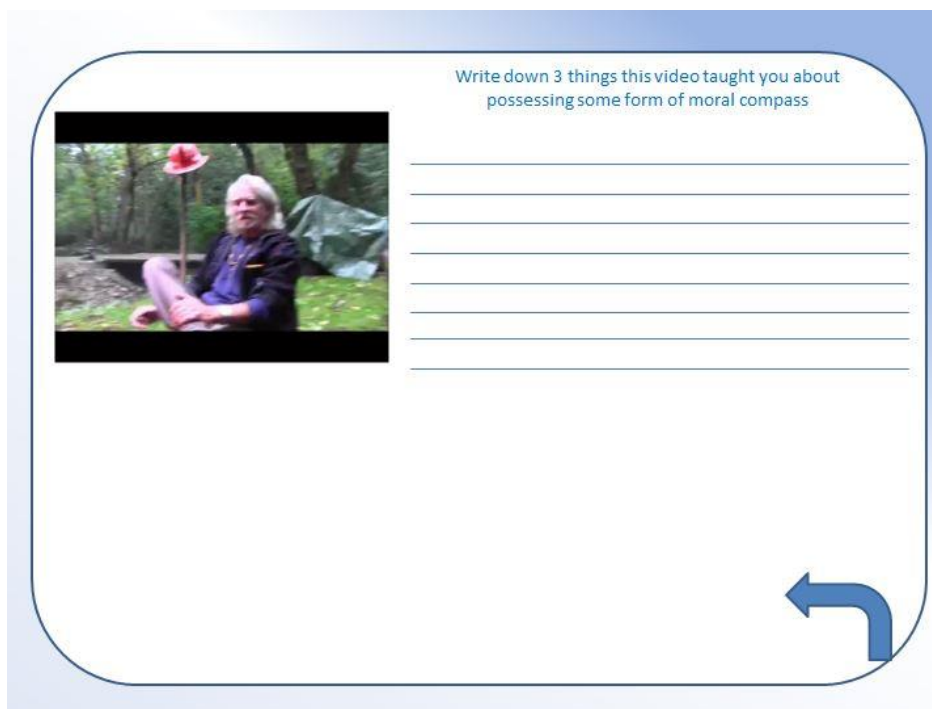
6.5.4 Support from Other Paramedics.

The paramedics' stories and experiences written on the online forums suggested that many go through traumatic events that stay with them for months or years. While paramedics in this position may need help and support, many paramedics felt that they would prefer support from co-workers and people within the paramedic profession rather than someone external. This theme was noted in both the online forum study and in previous research (Dodd, 2017; Mildenhall, 2012b; Quaile, 2016). The STDRT was therefore oriented to include approaches that were closely related to the paramedics' own work culture. For instance, the moral compass task included a video from former


paramedics discussing their own experiences. Given that the online forum study suggested that paramedics preferred to receive advice about work stress etc. from other paramedics as opposed to a figure from another profession (see Chapter 8, Section 8.1.5), I decided that a video from former paramedics would be best suited. Therefore, paramedic users would be more likely to engage with the STDRT and relate to the experiences of the individuals in the video (see Figure 6.12).

Figure 6.12

Screenshot of the STDRT for the moral compass task



Write down 3 things this video taught you about possessing some form of moral compass



6.5.5 Masculinity and Psychological Therapy.

Similarly, the STDRT contained a video to explain psychotherapy using a military soldier suffering from PTSD. The information from the online forum study helped to select this particular video. The forum posts frequently alluded to the masculine work culture that exists in paramedics. Some forum users even displayed a more disdainful approach to mental health treatment. The video of psychotherapy in

military soldiers was therefore selected to help demonstrate that no one is immune to mental distress in the face of trauma, and those who may typify certain representations of masculinity also may need help in the face of this.

It should be further noted that while the online forum study produced some interesting information, some of this could not be incorporated into the STDRT for practical reasons. For instance, a notable finding of the study was that several paramedics reported that the station alarms cause increased heart rates and sharp feelings of anxiety. This effect was further reported to extend to other loud abrupt noises such as phones ringing. While this finding was interesting, it is an effect that largely exists in the external environment. It was therefore difficult to envision a method that the STDRT could use to help address this issue for paramedics. It may be possible to incorporate CBT techniques into the STDRT that helps address the observed association between loud abrupt noises and anxiety levels. Prior to the online forum research, the STDRT already contained an animated breathing task and a meditation task that contains some elements of this already, in particular augmented exposure therapy (Foa, Rothbaum & Furr, 2003; Kircher et al., 2013). Nevertheless, it would be interesting for future research to investigate this phenomenon in relation to work trauma and PTSD. This may be interesting as an independent study, or it could provide ways in which the STDRT can use psychological techniques to help alleviate this effect in paramedics.

6.6 Summary of Designing the Self-Taught Digital Resilience Training Part 2

The online forum study therefore helped me to learn more about the paramedics' work culture and the specific coping mechanisms that they use to help deal with traumatic incidents. Many of these were incorporated into the STDRT in order to improve the capability of paramedics to engage with it and create more suitable tasks to

help improve their psychological resilience. I believe that the use of the online forum study to obtain factors of resilience in paramedics was a key reason as to why the STDRT was eventually rated favourably by the paramedic students in the feasibility study (see Chapter 8). Having this contribution allowed the STDRT to be more user-friendly to this specific workforce, and foster resilience more closely associated with this workforce. I decided that conducting my own primary research to ascertain the resilience factors of paramedics would improve the ecological validity of the STDRT. This was done using the online forum study, which resulted in the second version of the STDRT (see Chapter 7, Section 7.2). The development of the STDRT from the narrative literature review and online forum study, along with its subsequent feasibility testing, constituted a mixed-methods approach with both qualitative and quantitative studies. The next chapter will discuss the methodological approaches used in my thesis, pertaining to the online forum study and the feasibility study.

CHAPTER 7: METHODOLOGY

7.1 Introduction

So far, I have identified paramedics as a workforce particularly vulnerable to work stresses and mental distress, due to both critical incidents arising from their work and continuous stresses placed on them. The core aim of my thesis was to develop a digital self-taught resilience tool with the aim to foster resilience, and perform a feasibility study of this.

In this chapter, I will outline my methodological approach. There were two main studies conducted; the online forum study, and the feasibility study. The online forum study was a qualitative study, while the feasibility study was a quantitative study. Before explaining the methodology for these studies, I shall outline my personal preferences and ideals towards research prior to undertaking my doctoral studies, and how these were shaped during the research process. My overall aim was to develop and implement a self-help tool to foster resilience in paramedics, and evaluate this in a feasibility study. To help with this, I took guidance from the Medical Research Council on developing and evaluating complex interventions (Craig, 2008; Medical Research Council, 2008).

7.2 My Prior Approach Towards Research

Prior to my PhD program, my approach towards research was very much reductionist. I largely believed that the best method of studying a given phenomenon was to isolate the constituent parts and observe the singular effects these have on a singular outcome (Rosenberg, 2001). I also believed that Occam's Razor is an important aspect of scientific methodology. In this principle, scientific theories for events are best when they can explain as much of the event as possible using as little terms, or

mathematic equations, as possible (Burgess, 1998). Albert Einstein encapsulates this with the quote, “Everything should be made as simple as possible, but no simpler”. Theoretical physics as a discipline arguable takes this to extremes, with many physicists agreeing they should work towards a single explanation for all phenomena in the universe, known as The Theory of Everything (Tegmark, 1998). Can these principles be applied to scientific disciplines outside of physics? The famous quote by Ernest Rutherford, “All science is either physics or stamp collection” suggests that disciplines outside of physics are more oriented to categorise an array of phenomena into taxonomical groups rather than aim to develop a singular explanation for all phenomena (Wilkins & Ebach, 2013). From the outset, I personally believed that the fundamental principles of reductionism can be applied to psychology and social sciences. Even if a unified theory of psychology was not attainable, *aiming* to develop one would still produce the benefit of developing what Occam’s Razor suggests is the best way to present a theory: Explaining as much of the event as possible in the simplest terms possible. This in turn would theoretically also yield as few theories as possible which each explain as many observed phenomena as possible. Hence, at the start of my PhD, I approached the research project with a reductionist viewpoint. During my thesis, my views became less reductionist as I became more aware of the categorical and linear differences that ultimately exist on a psychological level among different groups of people, such as the difference in resiliency factors between military soldiers and paramedics. I also became more aware of some of the traps that can befall researchers due to an overly simplistic reductionism, which does not apply well to qualitative analysis for example.

7.2.1 Theoretical Basis of the Study.

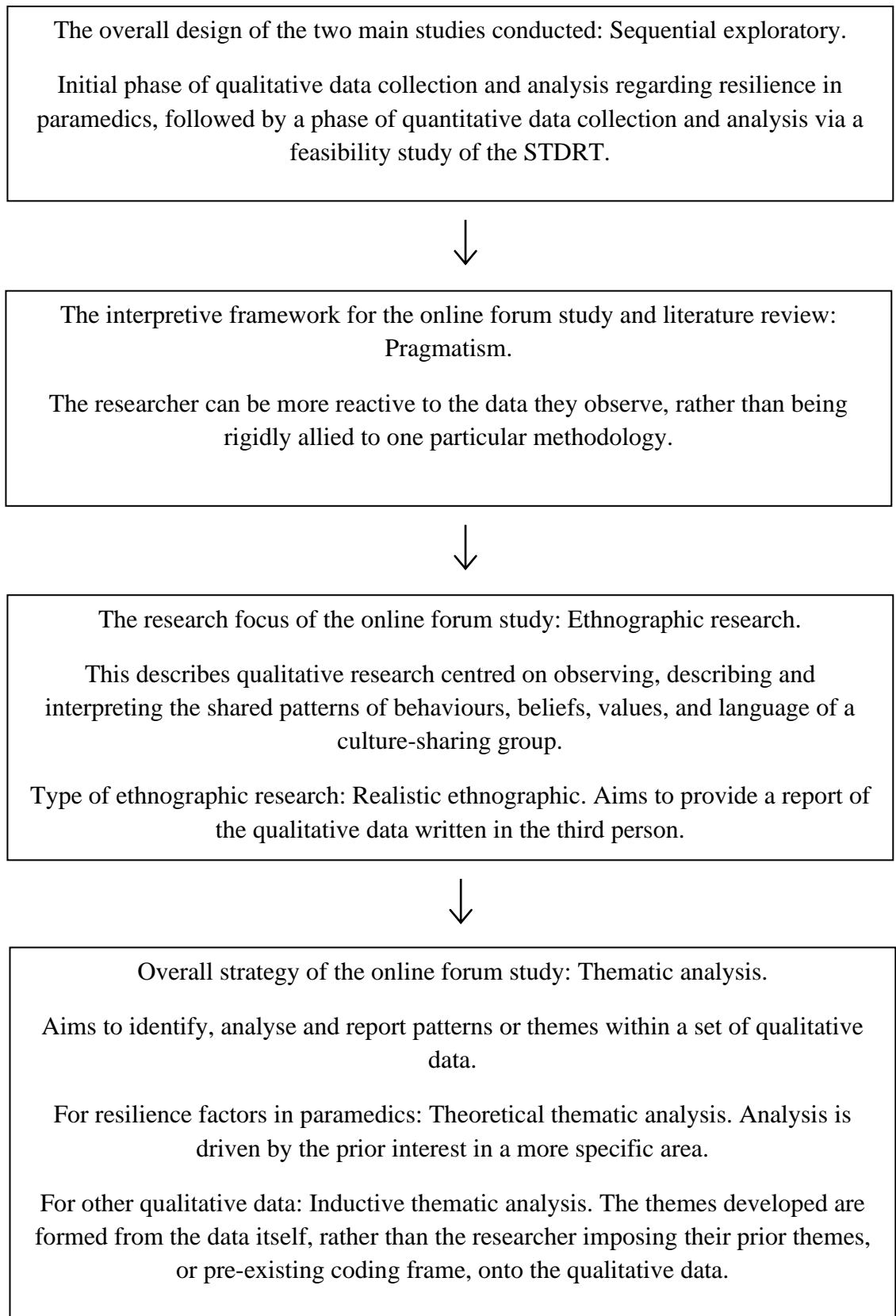
The need to develop a digital self-taught resilience tool has a coherent theoretical basis, as justified by the narrative literature review in this thesis (see Chapter 5). I have provided a history of PTSD as a diagnosable form of mental distress, and how research originally pertaining to PTSD in the military was later found to be also applicable in paramedics. Using the grey literature, I was able to examine a more personal account of work stress and trauma in paramedics. This suggested that paramedics are a particularly vulnerable group due to their exposures to both acute traumatic incidents, and chronic stressors. This also suggested that work stress and PTSD in paramedics has worsened since 2008 due to both economical and sociological reasons. In recent times they have had to content with their workload and stresses increasing and their resources to help deal with these decreasing. I have also highlighted the potential of DPFPSH as a new method of providing help with mental distress. I have highlighted its advantages, such as the potential for interactive components and capability of being used in low-resource settings. My narrative literature review has further highlighted the empirical research into PTSD and mental distress in paramedics. This has also reviewed and highlighted the potential for resilience fostering training to help prevent increases in mental distress in advance of traumatic incidents that may result in PTSD. Thus, my proposal to develop the STDRT for paramedics possesses a coherent theoretical basis.

7.3 The Online Forum Study: Methods and Qualitative Approach

The development of the STDRT was informed by the findings of both the narrative literature review and the online forum study. There were a number of different levels of methodological approaches taken, for both the two main studies conducted, and the online forum study alone. A summary of these is presented in Figure 7.1.

Figure 7.1

Summary of the methodological approaches for this thesis



7.3.1 Overall Design of my Research: Sequential Exploratory.

The STDRT is a novel resilience training tool developed in the course of this project. Additionally, my hypothesis prior to this research stated that factors of resilience will vary depending on different populations and workforces. This hypothesis needed to be explored. My thesis therefore used a sequential exploratory design. The strategy of a sequential exploratory design study typically consists of an initial phase of qualitative data collection, followed by a quantitative data collection phase (Creswell, Feters, Clark & Morales, 2009). My thesis aimed to perform a qualitative study to investigate resilience to mental distress in paramedics. The data from this qualitative study, together with information in the literature, would then be used to develop the STDRT, which in turn would be assessed in a quantitative feasibility study. A sequential exploratory design was suitable, as it allowed both qualitative and quantitative approaches to be used in the thesis to test both an emergent theory, and a new instrument (Ivankova, Creswell & Stick, 2006).

There are further advantages to a sequential exploratory design being used. Namely, this provides greater involvement or participation of the paramedics (Creswell, Feters, Clark & Morales, 2009). The use of the online forum study to design the STDRT allowed the paramedics to have greater involvement and participation in influencing which resilience factors were prioritised, and what methods and approaches the STDRT used. The involvement of paramedics in the qualitative phase of the study helped improve the ecological validity of both the STDRT itself, and the feasibility study (Creswell, Feters, Clark & Morales, 2009).

7.3.2 Interpretive Framework of Online Forum Study: Pragmatism.

In most qualitative studies, an interpretive framework is used to guide the process of the research. Generally, an interpretive framework is a paradigm or belief

that a researcher applies to a qualitative study and can take many different forms (Creswell & Poth, 2017). In conjunction with my general approaches towards research, my interpretive framework for the online forum study was pragmatism. A pragmatist framework states that there is an external world independent of the mind as well as phenomena that exist ordinarily in the mind (Creswell & Poth, 2017). The framework advocates that rather than restricting the way in which we can study these two realities by staying rigid to one particular methodology, the individual researcher can be more reactive to the information they encounter and choose the methods and techniques they judge to be most suitable (Cherryholmes, 1992; Murphy, 1990; Rossman & Wilson, 1985).

7.3.3 The Research Focus of the Online Forum Study: Ethnographic Research.

While the interpretive framework is a fairly flexible concept that may take many different forms, the research focus is a more rigid concept related to the area of study interest. It is closely related to the study objective, and typically there are five sub-types of the research focus (Creswell & Poth, 2017). The research focus used in the online forum study was broadly framed as ethnographic research. Ethnographic research describes qualitative research centred on observing, describing and interpreting the shared patterns of behaviours, beliefs, values, and language of a culture-sharing group (Harris, 1968). The culture-sharing group may include work cultures, including paramedics.

Using an ethnographic approach allowed myself to observe how traumatic work incidents affect paramedics both as individuals and as a collective workforce by being immersed in the forum posts. This meant that the qualitative research focused on observing for patterns relating to the mental and behavioural responses to dealing with traumatic incidents. This also allowed observations as to whether these were beneficial

to the paramedics or counterproductive. This involved both the thoughts and actions themselves, and the language used to convey them. Additionally, I aimed to study the forums for evidence of both general coping mechanisms used by paramedics and any formal strategies for dealing with PTSD. As well as these coping mechanisms, I aimed to observe the experiences that paramedics undergo in their work. I aimed to use the ethnographic research to obtain a better idea of what types of traumatic events paramedics' experience within their work culture, and how this may be similar or different to other stressful professions with expected exposure to trauma.

There are variations in the different types of ethnographies that can be done (Creswell & Poth, 2017). In my study, it was decided that a realistic ethnography was to be used. This approach typically aims to provide an objective report of the qualitative data written in the third person (Van Maanen, 2011). While I did encourage participation in the forums using the initial forum post (see appendix 5), I largely remained a passive observer of the online forums, and aimed to avoid bias in reporting.

7.3.4 Overall Strategy of the Online Forum Study: Thematic Analysis.

While this qualitative research was guided using an interpretive framework and a research focus, an overall strategy was needed to help further ensure that the online forum study collected and reported data in a consistent fashion.

An important aim of my research was to identify themes and meanings across the data with regards to the paramedic's accounts of their resilience, experiences with traumatic events and experience with both PTSD and PTSD symptomology. It was therefore decided that thematic analysis was the most suitable strategy for the online forum study to use. Thematic analysis aims to identify, analyse and report patterns or themes within a set of qualitative data (Braun & Clarke, 2006). This therefore allows researchers to identify themes, effectively placing reported information into categorical

groups (Braun & Clarke, 2006). This approach allowed me to categorise themes relating to paramedic's resilience, coping mechanisms in the face of PTSD, and enduring PTSD symptomology. Thematic analysis also gave me the flexibility to observe other themes and categories as I went along if I noticed a particular pattern that was frequently occurring during the analysis, regardless of whether or not it was directly related to my hypothesis.

The inherent flexibility of thematic analysis allowed me to alternate between different sub-variations of thematic analysis during this study. As my prior narrative literature review identified a number of resilience factors associated with professions with similar levels of stresses to paramedics, this formed a pre-existing coding frame at the start of the analysis. Essentially, I was seeking information from the online forums that was directly related to my hypothesis for resilience factors in paramedics. Therefore, for this aspect of the forum analysis, I used theoretical thematic analysis. This is whereby the thematic analysis is driven by the prior interest in a more specific area (Braun & Clarke, 2006). This allowed myself to retain the information I obtained from the narrative literature review relating to resilience and PTSD after traumatic events, and see if the online forum study built on this, contradicted this, or added any new information to this.

Additionally, I was also interested in using the online forum study to obtain any potentially useful information even if it was not directly related to my hypothesis. I felt that this was potentially useful in identifying other means and methods of helping paramedics that could be integrated into the STDRT that I had not previously considered. I also did this out of intellectual curiosity, and also because I believed that the theoretical thematic analysis would be less prone to researcher bias if I was reading through the forums with an open mind towards content, rather than simply focusing on

information relating directly to my hypothesis. Therefore, I used inductive thematic analysis for all other aspects of the online forum study that were not directly related to my hypothesis. In this approach, the themes developed are formed from the data itself, rather than the researcher imposing a pre-existing coding frame onto the qualitative data (Braun & Clarke, 2006). This therefore gave me the flexibility to develop new themes and ideas from conducting the online forum study, rather than being limited to focusing on my prior hypothesis only. While I hoped that this would additionally help avoid researcher bias, Braun and Clarke (2006) point out that researchers can never be entirely free from their theoretical and epistemological commitments.

7.3.5 Inductive and Deductive Reasoning.

The online forum study was conducted based on the hypothesis that paramedics possess resiliency factors more salient to their own work population group. In this aspect, deductive reasoning was used in the online forum study. Deductive reasoning describes the process by which a researcher builds an experiment designed specifically to test a prior hypothesis (Glaser, 2014). Previous research on other populations gave me a reasonable idea of some of the underlying factors. For instance, a hardy personality characteristic is related to resilience to PTSD in military personnel (Bartone, 2000; Bartone, 2006). It would be reasonable to assume that a similar relationship may be present in paramedics. Nevertheless, conducting primary research on paramedics rather than relying on secondary source information on other population groups has advantages. Namely, there is a lack of previous research focusing on PTSD and resilience in paramedics specifically as a population. While a reductionist approach may advocate that resiliency factors are universal among all people, my PhD research has made me more aware of the psychological and cultural differences between different population groups, and less reductionist approaches are needed to research resilience

and responses to mental distress in specific population groups and workforces. Doing so may help yield some interesting and novel findings.

However, I did not hypothesise exactly what these resilience factors would constitute of. I therefore aimed to conduct this research with an open mind and aimed to be reactive to what the qualitative data was indicating rather than making relations to a prior hypothesis. For this aspect, inductive reasoning was used. Inductive reasoning is often referred to as the process of obtaining data and building an explanation or hypotheses to explain it (Glaser, 2014). While it is sometimes thought that deductive reasoning and inductive reasoning are mutually exclusive, this is not necessarily the case. Richardson (1996) points out that in most cases, all qualitative research involves both deductive and inductive reasoning. Qualitative research often moves from both ideas to data, and data to ideas.

Thus, the online forum study shifted between deductive reasoning and inductive reasoning rather than being constricted to one or the other. This alternation between the two was used throughout the online forum study as well as the respective interpretive framework, research focus and overall strategy.

7.4 Online Forum Studies in the Research Literature

The use of online forums to generate qualitative data is a relatively new research tool that represents a novel aspect of my thesis (Germain, Harris, Mackay & Maxwell, 2018; Mann & Stewart, 2000). The online forum essentially acts as a focus group, though with different advantages and disadvantages both practically and methodologically. There have been no previous studies applying this as a technique to support practitioners or to deal with occupational trauma in paramedics.

7.4.1 Advantages of Online Forum Research.

As this type of research is relatively new, it is worth outlining the advantages and disadvantages of online forum research, in contrast to a face-to-face situation such as an interview or a focus group. One of the advantages is that participants may be more open to discussing a sensitive issue such as occupational trauma. Online forum research provides the advantage of making the participants feel more open to discuss sensitive topics. They do so by providing anonymity to all individuals involved in the study (Ybarra, DuBois, Parsons, Prescott, & Mustanski, 2014), and providing them the time to compose and think about their answers before they provide them, as opposed to 'being put on the spot' (Vicsek, 2016; Woodyatt, Finneran, & Stephenson, 2016). Along with this ability to compose responses, the synchronous nature of the online forums means that questions can be asked spontaneously; hence seeking help can be done at any given time (Vicsek, 2016). Therefore, this may increase the participant's willingness to discuss sensitive topics relating to occupational trauma and PTSD that they may not otherwise discuss face-to-face. These online forums may also represent a form of 'protected' space, where the participants understand that other members have shared identity and experiences. Hence, views can be shared with less reticence amongst this group but without fear of exposure, as many participants operate under on-line pseudonyms. Even within the relatively protected spaces of the workplace environment, such as the canteen or ambulance cab, there may be some subjects that are not fully or honestly discussed.

In face-to-face focus groups or interviews, participants may feel uncomfortable emotionally, feel conscientious about the impression they make on the interviewer and other participants, and withhold information useful to the study (McLafferty, 2004). For instance, in the thesis on traumatic experiences and resilience in paramedics by

Clompus (2014), she notes that one of her interviewees became upset and cried during an interview about their experiences. Clompus felt that the interviewee seemed to want to leave quickly, and the quality of the information generated was compromised.

There are further practical advantages of using online focus studies compared to traditional in-person focus groups. As the forums I used were text-based, they did not need to be transcribed from audio to text, unlike face-to-face focus groups. This approach saved time and effort that would otherwise be put into transcription (Franklin & Lowry, 2001; Walston & Lissitz, 2000: in Vicsek, 2016). Additionally, these types of studies do not require participants to travel to a central research area, the study can potentially recruit a larger sample, and the study can continuously take place over a prolonged period of time (Vicsek, 2016; Woodyatt et al., 2016). This was particularly helpful to my study, as many paramedics were busy with their work schedule and would have found it difficult to find the time to take part in a face-to-face focus group.

7.4.2 Disadvantages of Online Forum Studies.

The use of an online focus study represents a novel aspect of my research, and provides an array of advantages compared to traditional in-person focus groups. However, there were also potential disadvantages that I had to acknowledge and contend with. For instance, *threading*⁴ was a recurrent issue. In one respect, this worked as an advantage, as it allowed the forum users to respond and provide data to any question at any time, which could not be done as easily in face-to-face focus groups. On the other hand, it made the forums difficult to follow at times, due to it being unclear as to which question the forum users were providing answers for.

⁴ Threading is whereby some online forum participants reacted to previous questions, while others were already answering a new question. This makes it more difficult to attribute forum posts to specific questions at times (Vicsek, 2016).

My study contained several other potential disadvantages compared to face-to-face focus groups. Non-verbal cues such as facial expressions and body posture were unavailable. This meant that less rich data was collected with regards to what participants were thinking or feeling throughout the study (Vicsek, 2016). For example, it was at times difficult to tell if a participant was saying something calmly or angrily based on the text-based communication alone.

Additionally, while online forum research is useful for analysing opinions and experiences, they are not completely reliable for therapeutic facts. For instance, Mitchell et al's (2016) online forum study on cannabis use suggested that many users believed that cannabis is beneficial in dealing with ADHD symptoms. The research on this subject however is more mixed, and suggests that cannabis use can cause ADHD symptoms (Lisdahl et al., 2016). Therefore, this represents a forewarning of forums spreading potentially inaccurate or unproven information.

The argument against the use of online forum studies due to the potential inaccuracy of information has been countered by several researchers. In defence of their online discussion study, Smith, Bulbul and Jones (2017) argue that many traditional qualitative data sources could also have their integrity questioned, such as letters and diaries. Additionally, a commentary on online forum studies by Im and Chee (2006) argues that the credibility of information from online forum studies can be indirectly measured by the forum's response and retention rates. A forum with high levels of these would indicate that the participants were interested in the forum, and they were engaged with discussion for a long time. The authors argue that this is an indirect measure of the authenticity of information sent in an online forum. Researchers may therefore have a measure of the credibility of information in online forum studies.

As well as the credibility of the information, an additional issue often raised in online forum studies is whether the identities of the participants can be trusted. Demographic data such as age and location may be obtainable depending on the individual online forums. Even when this is available, the trustworthiness of the user profile may still be questionable. In the current context, one may argue that I cannot be absolutely sure if the forum users were indeed paramedics, or if they were aiming to obtain help with issues such as PTSD. As this is a relatively new research technique, there are no available estimations for the rates of false or untrustworthy online forum profiles.

An article by Pulman and Taylor (2012) discusses the concept of Munchausen by Internet. This is whereby an individual fabricates an illness over the internet for attention and sympathy (Pulman & Taylor, 2012). Pulman and Taylor (2012) state that there is currently limited information to how prevalent this is, but case studies at present demonstrate the devastating effects this can have when the truth is revealed. If such issues are identified in the current study, then it could have profound consequences both methodologically and ethically. That said, such uniquely pathological individuals may be more likely to be involved in forums defined by occupational groups. False interlopers to such groups may be vulnerable to exposures by other group members, more likely to be alert to findings of veracity and verisimilitude.

Further research is required to explore the potential issue of Munchausen by Internet (Pulman and Taylor, 2012). Generally, it appears that while anonymity on forums may increase trolling and rudeness (Berg, 2016; Coles & West, 2016) it is more likely to increase honesty, as observed in a number of studies (Min, 2007; Murray & Sixsmith, 1998; Ruesch & Märker, 2013). Smith, Bulbul and Jones (2017) propose that anonymity would decrease embarrassment in talking about sensitive topics, thus

increasing honesty. Given that anonymity is linked to reduced social desirability bias (Joinson, 1999), people may have less incentive to lie for attention if that is attention is reduced or nullified by anonymisation.

Another potentially substantive issue that may affect the generalisability of the results from an online forum study is the approaches to different cultures. An often proclaimed advantage of online forum studies is that they can access participants from different countries and cultures (Grace-Farfaglia et al., 2006). However, obtaining data from a variety of cultures is not as simple as it may seem. The literature review by Gallagher and Savage (2013) discusses how forums from different countries may not necessarily have differing online community cultures. This may lead to studies exaggerating the cultural differences across their studies. Online forum research should therefore take care in claiming to be obtaining multi-cultural data.

Furthermore, as explained by Whitlock, Powers and Eckenrode (2006), online forums will also possess their own culture governed by subtle and overt norms. An example may be the rules posted and enforced by the forum moderator. This may affect participant self-selection in study recruitments in an unpredictable manner, causing a reduction in the diversity of the total participants. As each online forum would possess its own culture, the forums would have to be studied individually by the researcher using qualitative approaches to immerse themselves within the community (Weslowski, 2014).

7.4.3 Previous Online Forum Studies.

To my knowledge there have been no previous studies applying this technique specifically to paramedics suffering from mental trauma caused by critical incidents. There have however been studies that have used qualitative analytical techniques on online forums concerning other health-related subjects. This can provide particular

advantages in health research. Gough (2016) used thematic qualitative analysis on online forums about male depression. He aimed to observe how men described depression *themselves*. Therefore, the online forums provided a more naturalistic context that was free from extraneous effects caused by the researcher (Frazier, Tix, & Barron, 2004). This was important, as Gough (2016) felt that in an in-person interview, the male participants would have concealed the extent of their depression due to ‘acting masculine in front of the researcher’. Using the online forum, he was able to transcribe coping mechanisms, and observe that many men were concerned about whether they actually had a legitimate diagnosis of depression. The current phase of my study similarly hoped to find coping mechanisms used by paramedics. I also hoped to avoid the issue of ‘masculinity bias’ and research bias using the online forum method.

Other studies have used online forums to obtain mental health related information. Jarrett (2017) performed qualitative deductive thematic analysis on forums for women with perinatal depression. Using this technique, she identified reasons why this illness is difficult to diagnose. These were mostly due to the symptoms overlapping with pregnancy. Additionally, she was able to divide symptoms into five main groups. The forum study I intended to conduct aimed to identify coping mechanisms and reoccurring themes. Therefore, my study aimed to adopt a qualitative technique akin to Jarrett (2017).

I inspected the specific qualitative techniques used by the above researchers in order to gain insight about the methods that I should use. Jarrett (2017) used a deductive thematic analysis. This was a theoretical, top-down approach, whereby this was driven by the researcher’s hypothesis. Thus, they aimed to fit their data into a pre-existing coding frame. This particular approach was not exactly suitable for my research, as I did not possess a pre-existing coding frame. I did however have a general plan of what my

research was looking for, namely coping mechanisms. However, I was also open to obtaining other related data that I had no prior coding frame for, such as underlying causes of work stress in paramedics.

Similarly, Gough (2016) used a version of qualitative thematic analysis. Rather than deductive analysis, they used constructivism (Braun & Clarke, 2006). They therefore examined how the male participant's views on depression were shaped by their experiences, realities, environment, and opinions, without the use of a pre-existing code-frame. Therefore, the direction of their study was driven by the data that was collected synchronously.

My study aimed to investigate the coping mechanisms and resilience factors that paramedics use in order to help deal with work-related stress. Therefore, I had a prior theme that I intended to explore. The narrative literature review I conducted already identified a number of resilience factors associated with other population groups. Therefore, this provided a pre-existing coding-frame. Thus, theoretical thematic analysis seemed appropriate for coding and forming themes for the paramedics' stated coping mechanism. As well as coping mechanisms and resiliency factors, I was also interested in information from the online forums that, while not directly related to my hypothesis, was potentially useful in identifying other ways to help develop the STDRT. For example, if there was a specific type of language that paramedics use to describe psychological trauma, then this could be coded and identified in this study. The STDRT could hence use the same type of language to help relate to the paramedics more suitably. Thus, the study also aimed to obtain data-driven information. Therefore, inductive thematic analysis was used for all other aspects not directly related to resilience factors and coping mechanisms.

It is common for qualitative research to have a third-party individual coding the data for reliability. For instance, Moore and Ayer's (2016) research had a third researcher trained in thematic analysis to code 10 themes and 5 quotes from their research. There does exist some disagreement over whether reliability in qualitative research is achievable. Some researchers believe that reliability in qualitative research is attainable as long as the results can be generalised (Golafshani, 2003; Johnson, 1997). Other researchers believe that attaining reliability in qualitative research is not possible, and is a natural disadvantage of qualitative studies compared to quantitative (Golafshani, 2003; Patton, 2001). This argument proposes that the validity and reliability of qualitative research is specific to the test it is used in at the time, and will not be the same in repeated tests. Similarly, the check for reliability using intercoder reliability is criticised for essentially being one researcher training another researcher to think the same way as themselves when reading a fragment of text (Vaismoradi, Turunen, & Bondas, 2013).

Thus, the ability to achieve true reliability in qualitative research is questionable. Qualitative researchers tend to seek different but analogous characteristics of rigour, such as confirmability or credibility of the findings. The current research obtained a measure of this through discussion with the supervisory team. Discussions about emerging themes were made with the supervisory team, and a credibility check was made. While no quantitative score was used, general agreements on the emerging themes based on the data were obtained. Given the aforementioned issues to achieving true reliability in qualitative research, this was considered to be an accepted method of achieving rigour. Furthermore, the large size of the dataset and time limitations imposed on the project made the recruitment of a third-party researcher to conduct a full inter-coder reliability check impractical.

In order to select appropriate online forums to be used in the study, a Google search was done using key words. It was decided that identifying three forums would be most suitable. Any more than would have likely resulted in an over-abundance of data, and the qualitative analysis process would take too long. In order to obtain data that is more relevant to the UK, the *UK Ambulance Forum* was selected. However, this did not possess a large amount of information relating to mental health in paramedics. Therefore, two US based forums with more relevant content were also selected: *EMT City* and *EMT Life*.

7.5 Ethics for the Online Forum Study

While the *EMT City* and *EMT Life* forums were open to the public, the *UK Ambulance Forum* was restricted to registered members only. Therefore, permission from the *UK Ambulance Forum* admin was sought. This was done using the private messaging features within the forum website. The aim, study purpose and relevant contact details were provided along with the participant information forum posts (see Appendix 5). Permission from the *UK Ambulance Forum* admin was granted on 14/11/16. Ethical approval for the online forum study was obtained from the UCLan STEMH (Science, Technology, Engineering, Medicine and Health) Ethics Committee on 02/03/17. The unique reference number was STEMH 546.

I posted a forum thread encouraging discussion in this topic while also making it clear that this was part of a research study (see Appendix 5). In order to ensure that the forum users gave permission for their individual posts to be included in the thesis, consent request was sought using the private messaging feature within the forums. This was done using a standardised template message (see Appendix 6).

The forum posts included in the qualitative analysis were insightful and helped contribute to the development of the STDRT (see Chapter 8). Most participants in the

UK Ambulance Forum gave permission for their posts to be included in this study. For the EMT City and EMT Life Forums, several participants responded to give their permission for their posts to be included. These latter two forums were publically accessible. Other forum users did not respond, despite the usefulness of their responses in outlining the points that are made in this chapter. As online forum research is a relatively new research method, a standardised set of ethics for this has not yet been established. Therefore, it is not always clear as to whether information on public access forums can be included in publications without direct consent from the original forum user (Sugiura, Wiles & Pope, 2017). Hence, forum posts that were granted permission from the respective forum user were included in verbatim. It was felt that those that were not given permission could not be presented in verbatim. While many were on public forums, the sensitivity of the information meant that this was not suited to use without the permission from the original user. Hence, complete anonymization and paraphrasing was used to retain the meaning but prevent the forum post from being traced back to the original user. This approach is recommended by Gustafson and Woodworth (2014) who suggested that paraphrasing forum posts would not only help protect the user's privacy, but would also allow readers to better evaluate the credibility of the results. This is because they can assess how meaningfully the researcher can capture opinions within the paraphrase. In order to provide sufficient context, the year the forum post was made (but not the date or month), the gender and the given occupation of the forum user were included in the otherwise paraphrased forum posts.

7.6 Terminology for those in Online Forum Study

As research using online forums is relatively new, there does not appear to be a standardised term for the 'participants' who are included in this. The forum users were able to provide consent to have their forum posts included in the study. However, as

many forum users created their posts earlier, and were asked for it to be included after the initiation of the study, they were not participants at the time their posts were made. Therefore, the term ‘participant’ is not entirely suitable to describe the individuals involved in this forum study. While Horgan et al. (2013) use the term ‘participant’ to describe the 18-24-year olds discussing depression in the forum, that particular forum was created specifically for their study. The forum users in that study knew they would be a part of the study from the beginning. I therefore looked at studies more similar to my own. In Gough’s (2016) online forum research on male depression, his results section simply refers to the ‘participants’ as ‘men’. My study cannot follow this approach, as the ‘participants’ are mixed gender, and are from a wide range of professions. Additionally, the forum study by Mitchell et al. (2016) treated the forum threads and posts themselves as the data source, rather than the individuals creating the forum posts. Their demographic data is exclusive to threads and individual posts, and not ‘the people behind them’. Therefore, I decided to adopt an original approach, and refer to the ‘participants’ in my online forum study as ‘forum users’. This term will be used throughout the rest of this chapter.

7.7 EMT City Forum Users

From the EMT City Forum, 67 relevant forum threads were taken. Within this were 374 forum users. Demographic information was collected by manually obtaining this from the user’s profile pages, whenever this information was possible. Of the 374 forum users, 283 did not provide a year of birth. The remaining 91 forum users possessed a mean age of 40.83 years, with a standard deviation (*SD*) of 10.38. This average age may seem higher than expected, given that previous research in this area tends to find that younger people use internet forums for help with mental health more (Cohan et al., 2017; Kummervold et al., 2001). However, research on online forums is

still in its infancy stage overall, and other variables need to be investigated. For instance, while younger people may use internet forums more, older paramedics will have more time and experience in their job, which would make them more susceptible to experiencing traumatic events, and suffer from burnout (UNISON, 2013). Coinciding factors such as this may therefore shift the average age of this population to that which is greater than most other internet forum studies. Another possibility is that the demographic of the forum users reflects the age profile of the paramedic or emergency workforce in general, rather than those who have been traumatised and are seeking help. Data USA (2019) suggests that the average age of EMTs and paramedics in the US is 35.9 years. This may suggest that the average age of paramedics and EMTs in this online forum study more closely reflects the workforce itself.

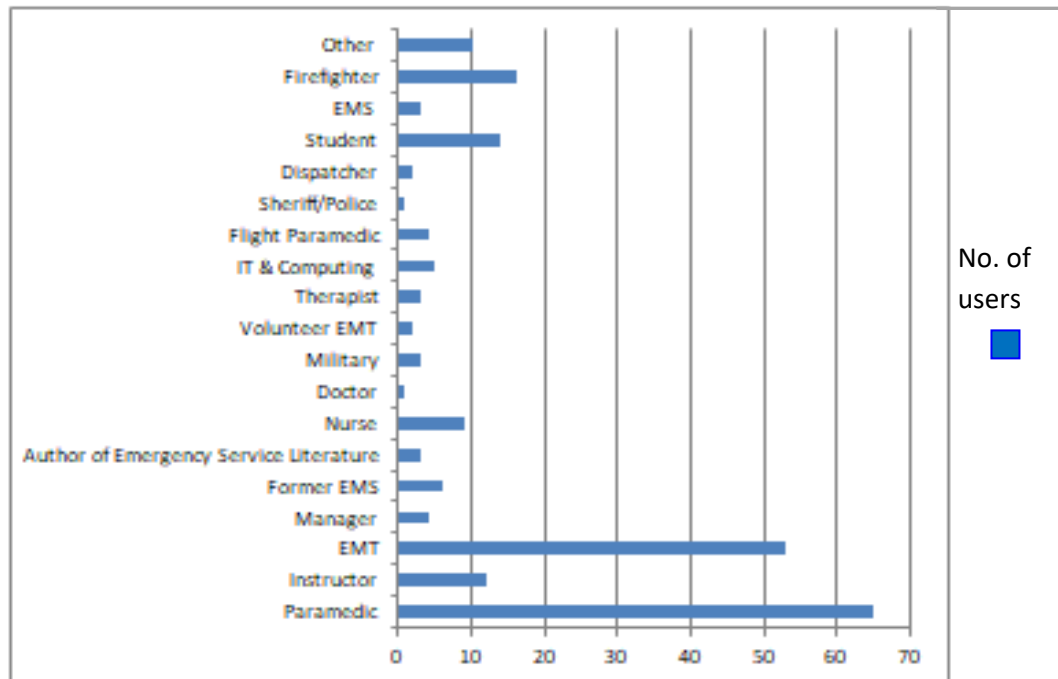
For gender, 128 forum users identified themselves as male, 53 as female, and 193 did not specify. This demographic sampling seems more familiar, with emergency services in the US being a more male-dominated profession (Chapman et al., 2008).

For occupations, this was a fairly difficult demographic to outline due to the vast variations of labels that the forum users gave to their professions. For instance, an EMT possesses a number of different umbrella titles depending on the exact speciality, such as EMT-basic and nation registry of EMT-paramedic. Thus, to simplify this, all umbrella categories have been grouped into their constituent category. Of the 374 forum users, 197 did not list an occupation, and 24 provided a bogus answer. Many forum users provided more than one occupation. These may have been previous occupations, or different entry levels of the same occupation. The majority of these were either paramedics or EMTs. Figure 7.2 shows a graph of the different professions listed. While this study is principally investigating paramedics, an input from other stressful and intense professions is useful, especially if it is similar to paramedics. In the US, EMTs

for instance perform similar tasks to paramedics, but at a lower level of providing care. For example, unlike paramedics they cannot provide treatments that involve breaking the skin, but can administer less invasive treatments such as CRP or provide oxygen.

Figure 7.2

The quantities of occupations for the forum participants in EMT City



The participant locations were also a difficult demographic from the forums to report, likewise to the participant occupations. Forum users were able to provide a location of any sorts. Thus, the locations provided were a mix of cities, states, regions and countries. The majority were US cities and states. Some were Canadian provinces, and a minority were outside the US and Canada. Due to the vastly different locations, it was impractical to present this on a pie chart or a bar chart. Instead, a world heat map was used to present this data visually (see Figure 7.3 and 7.4). This was made on Microsoft Excel using the free Add-in, Geographic Heat Map. This allows the positions given by forum users to be plotted onto the map, with the colour spectrum (yellow = low, red = high) providing approximations for the population densities in the given areas (Leskovec & Horvitz, 2007).

Figure 7.3

The locations of the forum participants in EMT City across the world

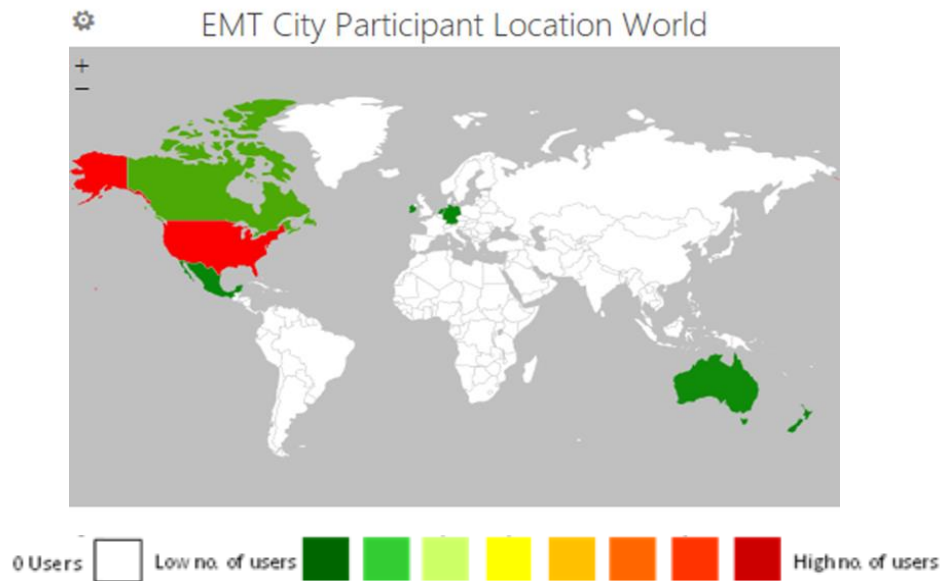
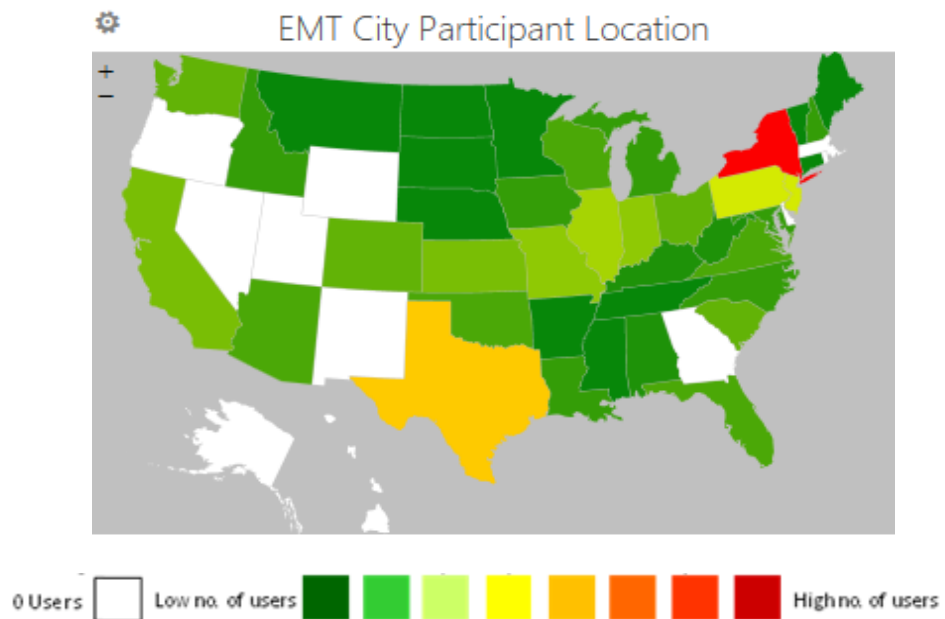


Figure 7.4

The locations of the forum participants in EMT City across the US



7.8 EMT Life Forum Users

From the EMT Life Forum, 190 forum users across were obtained across 18 included forum threads. Of these 190 forum users, 148 did not provide a year of birth.

The 42 forum users that did displayed a mean age of 37.00 years, with a standard deviation (*SD*) of 11.44. These are similar figures to the EMT City forum, further supporting my hypothesised interaction between the online forums being mostly used by younger people, and older paramedics having more traumatic work experience they wish to discuss with others.

Figure 7.5

The occupations of the forum participants in EMT Life

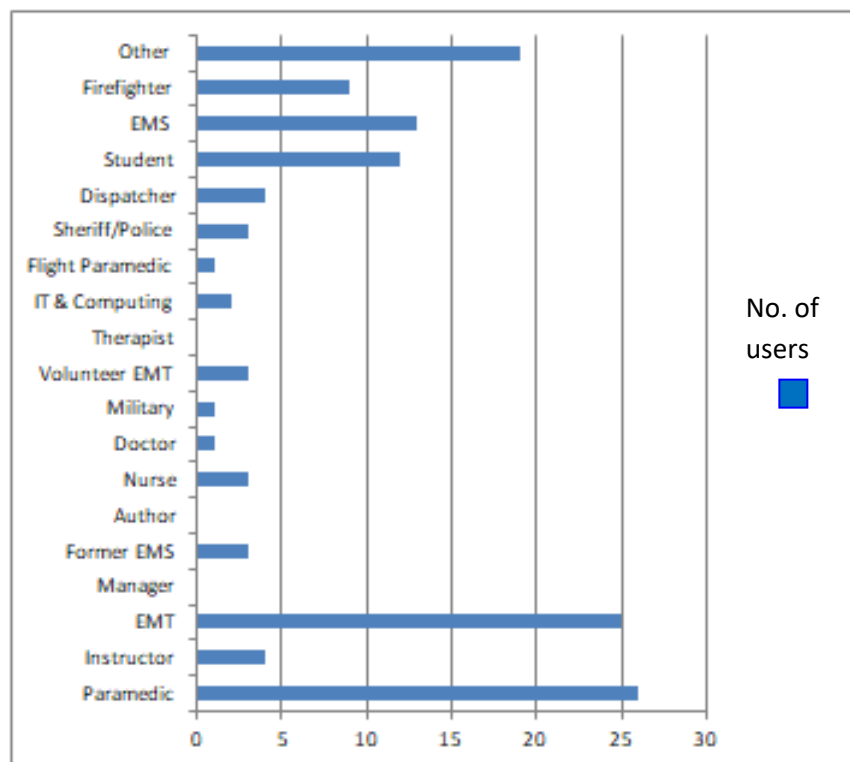


Figure 7.6

The locations of the forum participants in EMT Life across the world

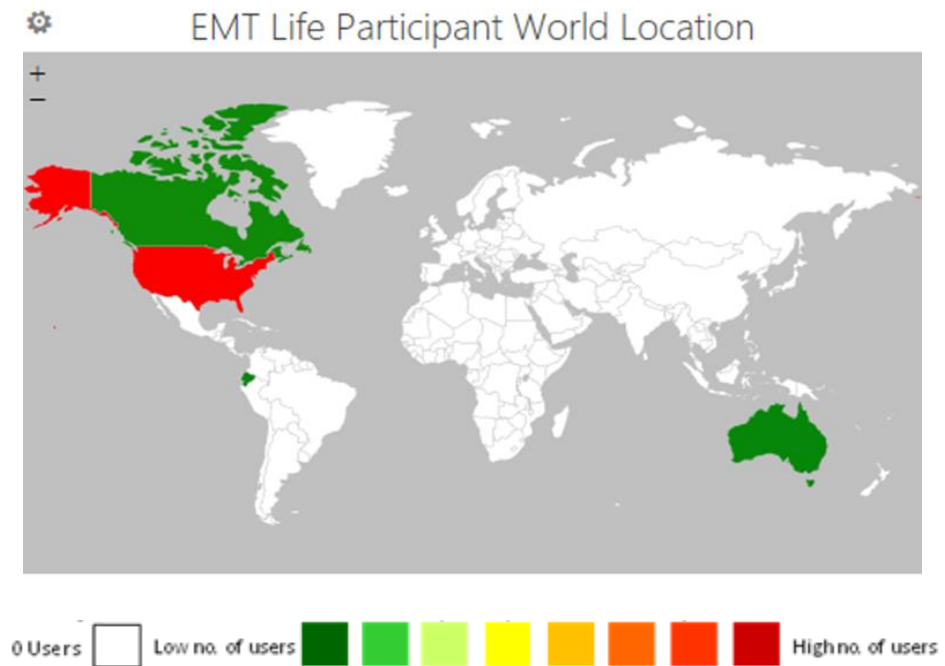
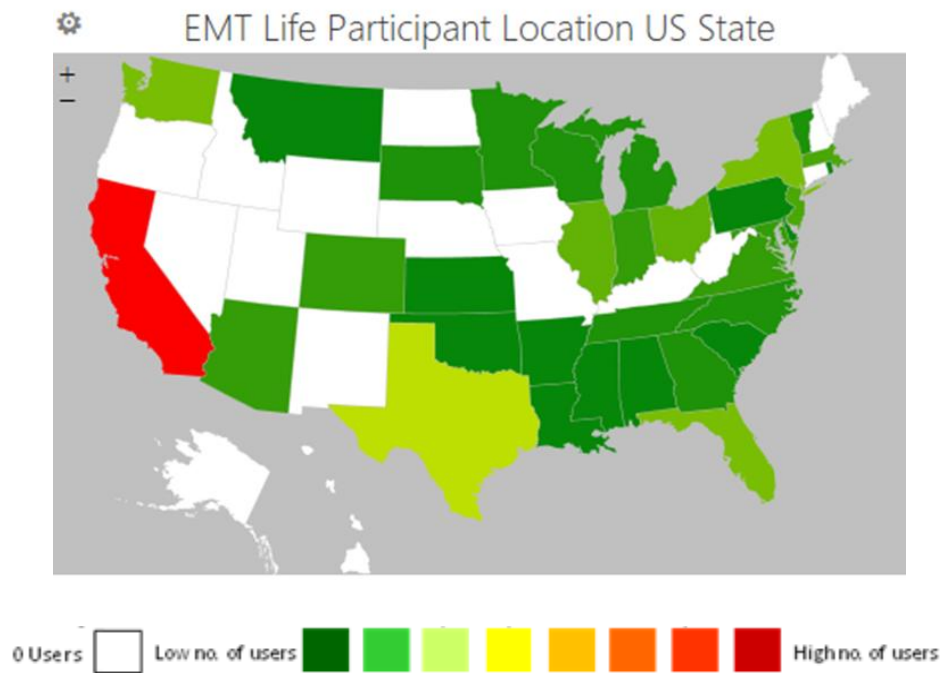


Figure 7.7

The locations of the forum participants in EMT Life across the US



For gender, 43 forum users identified themselves as male, 14 as female, and 133 did not specify their gender. Once again, a greater number of males compared to females were observed, reflecting the male-dominated profession of emergency medicine. It is also possible that a large proportion of the 133 forum users who did not specify their gender were female, and did not wish to disclose this information due to the male-dominated environment. Internet forums can often be a female-unfriendly environment (Herman, 1999; Postmes & Spears, 2002) with women frequently withholding information about their gender when possible. Nevertheless, future studies into the currently sporadically researched internet forums can provide further information on this.

As with the EMT City forum, the forum users were able to provide an open-ended answer to their occupation, leading to a vast variation of specific profession titles. Therefore, I likewise grouped these into constituent categories. Of the 190 forum users, 77 did not list an occupation, and seven provided a bogus answer. Figure 7.4 shows the list of occupations stated by the forum users in EMT City. The same occupation groups as EMT City were listed.

Similarly to the EMT City forum, the majority of the EMT Life forum users were EMTs and paramedics. Interestingly, the 'Other' category was greater for this forum than EMT City. This was most likely because of the greater number of firefighters who used these forum threads. The EMT Life forum has more forum users from California than EMT City (see Figure 7.4 and Figure 7.7). As California suffers from greater forest fires than other US states (Miller, Safford, Crimmins & Thode, 2009), it is logical that firefighters are also active in these forum threads about occupational trauma. Overall, these figures possessed very similar proportions of occupations. Figure 7.5 provides a graph of their stated occupations.

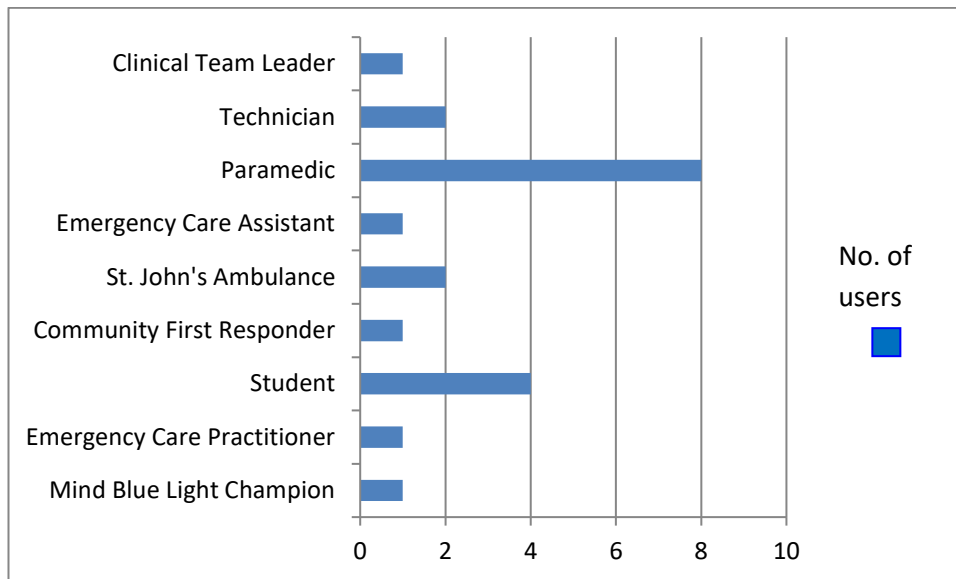
The locations of the EMT Life forum users possessed a similar pattern to the EMT City forum users. Figures 7.6 and 7.7 provide world density maps for this. Firstly, of the 190 forum users, 53 did not provide a location, and 19 gave a bogus answer. The remaining 118 forum users mostly provided one location, but sometimes more than one. These were likewise a mixture of cities, states, regions and countries. Furthermore, likewise to EMT City, the majority were from the US, with a minority in Canada, and a scarce minority in the rest of the world. Compared to EMT City, the EMT Life forum users appeared to be more evenly distributed across all of the US, while the EMT City forum users were more localised towards the east of the US. A greater proportion of forum users were from California, which may have made the locations more balanced across the US.

7.9 UK Ambulance Forum

This particular forum featured a notably lower number of forum users compared to the other two. This was due to being directed only at emergency service workers in the UK, and being a member-only forum. Thus, there were 19 forum users in total. Of these, six provided their age, resulting in an average age of 37.33 years, and a *SD* of 17.37. Indeed, there was a fairly broad spectrum of different ages given. No information for gender was provided in this forum. For location, 17 forum users stated that they were from the UK, and two did not state a location. Figure 7.8 shows their occupations. Three forum users did not specify an occupation. Several forum users provided more than one answer. Most were paramedics, with several other emergency medicine services also listed.

Figure 7.8

The occupations of the forum participants in the UK Ambulance Forum



7.10 Demographic Data from the Forum Analysis

In total, there were 583 forum users across all three forums. The average age of the grouped forum users who provided this information was 39.53 years ($SD = 11.16$). One hundred and seventy-one forum users identified themselves as male, 67 identified themselves as female, and 345 did not specify their gender. This provides a large sample size, and a high proportion of male forum users. Using the online forums, this research has overcome a problem of previous research in this area that had low sample sizes and a distinctly low proportion of male forum users (Clompus & Albarran, 2015).

Thus, the demographic information for the online forum has been outlined. This provided data on where the forum users come from and what their occupations are. This should also highlight how their data being collected via an internet forum provides a different array of advantages and disadvantages compared to interviewing participant's in-person. The results section (see Chapter 8, Sections 8.1 to 8.2) will provide an outline of the finding the qualitative analysis of the forum posts provided. The qualitative

software NVIVO was used to help organise and display the qualitative forum data. This allowed different themes for resilience factors, coping mechanisms and opinions to be mapped. The aim of the online forum study was to learn about resiliency factors that help reduce the likelihood of paramedics developing PTSD from their work stresses. I was additionally interested in the type of stresses that paramedics face, and identifying factors that may further increase work stress and PTSD rates.

7.11 Summary of Online Forum Study Methodology

The methodology of the online forum study has been presented in this chapter so far. This has described the qualitative methods that were used to analyse the online forums, and what type of information I was looking to draw themes from. I have also provided demographic data of the forum users involved in this study to present a clearer idea of their location, occupation and gender. For the next sections of this chapter, I will outline the methodology of the feasibility study.

7.12 Methodology of the Feasibility Study

This section will focus on the feasibility study. The feasibility study aimed to assess the prospects of a more complete RCT being conducted in the future. I will therefore outline the methodology of this feasibility study at this juncture. I will also discuss the aims of the feasibility study, and how I planned to achieve these aims.

7.13 Feasibility for the Randomised Controlled Trial

In order to fully understand this feasibility study, a brief description of an anticipated full RCT, should this be conducted, is required. Firstly, the proposed RCT would recruit a suitable number of participants (to be estimated by the feasibility study) and ask them to complete psychometric measures for resilience, PTSD and chronic fatigue. Secondly, the participants would be randomly divided into an experimental

group and a control group. The experimental group would be given the STDRT, while the control group would not. After a determined interval, the participants would then complete the three psychometric measures again. A two-way mixed design multivariate analysis of variance (MANOVA) would be conducted to assess the between condition differences for the experimental and control participants, the within condition differences for the time interval, and the interaction. In this proposed RCT, the research hypothesis states that the STDRT will be associated with increases in resilience scores, and decreases in trauma-related symptomology. The null hypothesis states that there will be no significant difference between the experimental and control group. This feasibility study aims to test if this study can be done, with recourse to the NIHR definition of feasibility study design (NIHR, 2019). The rest of this section will focus on the feasibility study, while making reference to the proposed RCT if the context is suitable.

7.14 Aim and Definition of Feasibility Studies

In this study, the definition of a feasibility study adheres to that outlined by the National Institute for Health Research (NIHR, 2019). A feasibility study is a smaller piece of research conducted before a main study. Such studies are used to estimate important parameters required for the main study. Essentially, they aim to answer the question, ‘Can this main study be done?’ (NIHR, 2019). This is different from a pilot study, which aims to observe if the components of the main study can work together in a smooth fashion (NIHR, 2019).

Before a main study can be done to assess the effectiveness of the STDRT in increasing resilience and preventing the onset of PTSD, a feasibility study is required to estimate important parameters. Previous research may be used to also obtain estimations of these parameters. However, as this is a novel area of research, there are too few

similar studies to gain sufficient knowledge of this. The one ongoing study with a similar subject, Wild et al. (2018) may provide useful estimates for these parameters. For instance, they proposed an estimated sample size of 570 student paramedics, and they proposed follow-up data collection at 6, 12 and 24 months after the start of the study.

However, since their study is still ongoing, caution must be taken in adopting their approaches before their study is complete, as their study may undergo changes or demonstrate issues in their parameters. Additionally, their proposed parameters may not be ideal for this particular study due to a number of key differences. One key difference is the outcome measures between this study and the ongoing study by Wild et al. (2018). My study aimed to measure both acute PTSD and chronic PTSD in paramedics as well as resilience. The study by Wild et al. (2018) does not propose a specific distinction between these two forms of PTSD, and instead they only focus on acute PTSD. They additionally aim to measure depression and biometric measures. Having different numbers of treatment arms would result in different estimated participant sample size (Whitehead et al., 2016).

Therefore, the use of a feasibility study is important for this study to estimate the parameters associated with its own main study. The NIHR (2019) provides details of the parameters a feasibility study should aim to obtain. One aim of feasibility studies is to provide an estimate for the sample size of the main study. This can be done using information obtained in the feasibility study, such as the effect size, the standard deviation etc, using a number of different methods (Noordzij et al., 2010).

As well as estimating the sample size of the main study, the feasibility study will need to recruit participants as well. The NIHR (2019) does not specifically state a fixed rule for ascertaining the sample size of the feasibility study. Hooper (2019), writing for

the NIHR Research Design Service, states that the sample size needs to be sufficient enough to meet the aims and objectives of the feasibility study, and this needs to be justified. It is for the researcher to choose how they justify this. They may approach this with statistical means, for example, determining a sample size required to statistically measure the drop-out rate within a 95% confidence interval (Hooper, 2019). Or the researcher may justify these using qualitative explanations for the sample size of the feasibility study.

Additionally, the NIHR (2019) definition of a feasibility study requires further evaluation of participation in advance of the main study. This includes observations on the number of eligible participants that is possible to recruit, the willingness of the participants to be randomised, and the willingness of researchers to recruit participants. Furthermore, the NIHR (2019) provides other parameters aside from the participants that are to be acquired in a feasibility study. These include the characteristics and suitability of the outcome measures, follow-up rates, adherence to measures, the availability of the data and time required for collection (NIHR, 2019). In this chapter, these parameters as defined by the NIHR (2019) will be addressed with regards to this feasibility study in this thesis.

7.15 Participants

The NIHR (2019) provides certain parameters that need to be considered as part of a feasibility study. These parameters are:

- Standard deviation: The standard deviation of the outcome measure. This is needed in some cases to estimate sample size.
- Randomisation: The willingness of participants to be randomised.
- Recruitment: The willingness of clinicians to recruit participants.
- Eligibility: The number of eligible participants.

- Outcome measure: The characteristics of the proposed outcome measure. In some cases, feasibility studies might involve designing a suitable outcome measure.
- Follow-up rates: Follow-up rates, response rates to questionnaires, adherence/compliance rates, ICCs in cluster trials etc.
- Availability: The availability of data needed or the usefulness and limitations of a particular database.
- Time: Time needed to analyse data.

The NIHR provides parameters for a feasibility study design, which is applicable in a study like mine utilising a new resource. I was also interested in the participant's engagement with the STDRT. Bowen et al. (2009) provides recommendations for feasibility studies testing an intervention program. These recommendations are:

- Acceptability: Are the target population accepting of the intervention?
- Demand: Do they use the intervention in the clinical setting or their own time?
- Implementation: Can the intervention be implemented?
- Practicality: Can the intervention be delivered, even in a low resource setting?
- Adaptation: Can the intervention be adapted to different clinical groups and settings?
- Integration: What changes to the existing infrastructure are required to integrate the new program?
- Expansion: Can an already successful intervention also be successful with a different population or in a different setting?
- Limited-efficacy testing: A feasibility study may perform a test of their intervention in a limited way.

For my study, I used the NIHR (2019) parameters for the design of the feasibility study, and some of the recommendations by Bowen et al. (2009) for the participant's engagement with the STDRT. The recommendations by Bowen et al. (2009) that were required for my feasibility study were: Acceptability, demand, implementation, practicality and limited-efficacy testing.

An eventual RCT would aim to observe if the STDRT can help increase resilience scores of paramedics, and help prevent increases in PTSD and PTSD symptomology. Therefore, the participants would need to be identifiable in beginner or novice paramedic roles, having not yet been exposed to traumatic experiences. Previous research into resilience often makes the mistake of using resilience promotion as a treatment for prior mental distress rather than to prevent the development of future mental distress (Cleary et al., 2018).

I therefore aimed to recruit first year paramedic students from the UCLan. This was done by first contacting the paramedic department at UCLan. The department allowed me to briefly present my proposed research at the end of one of their first year on-campus lectures and invite participation in my study. During this brief presentation, information sheets and consent forms were passed around the lecture room. The paramedic students were all asked to hand in the consent forms while exiting the lecture theatre, even if they had not signed it. This was to help provide anonymity, as the students who had signed the consent form would not stand out from those who did not. The students were also informed that the participant information sheet and consent form were sent to their student emails. This was to allow the students to agree to participate in the study if they needed more time to think about it after their lecture.

It was however possible that the first-year paramedic students had been exposed to critical work events, either outside of paramedics or early in their course. I was

informed that the paramedic students had Learning in Clinical Practice placements in January 2018. Therefore, it is possible that they may have been exposed to critical events prior to this study or prior to starting their course, and I cannot simply assume that they have not done so. The Davidson Trauma Scale (DTS) (see Section 7.16.1) requests identification of a trauma most disturbing to the participant. This can determine if the participants had prior trauma exposure to stage 1 of the study (see Section 7.18). Additionally, the feedback sheet (see Section 7.16.4) contained a question asking the participants, “Since you began your course at UCLan, what dates have you been on placement?” This allowed the participant’s potential exposure to critical incidents and work stress to be overviewed post-study. Thus, the identification of trauma in the DTS and the placement dates identified in the feedback sheet can help provide an idea of how much exposure to critical incidents the paramedic students had prior to the study. This information from this feasibility study may be useful in the development of the main trial.

Initially 17 first year paramedic students had signed the consent forms. These included 12 women and 5 men. These 17 participants were then randomly allocated to the experimental group (that would be given the STDRT) and the control group (who did not receive this). This was done by pulling names written on folded paper out of a hat. This randomisation was skewed using block randomisation, so that there would be nine participants in the experimental condition and eight in the control condition. With an odd number of total participants, the decision to place more in the experimental condition was made to help gain as much data related to the STDRT as possible. The randomisation was additionally skewed to make a roughly even number of male and female participants across both conditions. This was done because studies suggest that there may be differences in gender for responses to traumatic events and PTSD (McEwen, Gray & Nasca, 2015; Sarmány-Schuller, 2011). Since feasibility studies

focus on parameter estimation, the participant groups need not be allocated in a purely random fashion (NIHR, 2019). This resulted in six females and three males in the experimental condition, and six females and two males in the control condition. As part of the parameter estimation, I monitored how willing the participants were to be randomised (NIHR, 2019).

However, the number of participants decreased at each stage of the study, following drop-outs. 10 participants did not respond in stage 1, leaving seven participants in total completing this stage; five in the experimental condition and two in the control condition. This number further decreased, with two participants not completing stage three of the study. This resulted in five participants being included in the final data analysis of the study. As in accordance with the NIHR (2019) parameters of a feasibility study, the implications of this will be examined in the discussion section (see Chapter 9, Section 9.3).

7.16 Materials

The STDRT (see Chapter 6) was provided for the experimental condition participants. As part of this feasibility study, it was important to determine a suitable outcome measure. Two questionnaires were used to assess symptomology. One was to measure acute trauma, and the other chronic trauma, which are both prevalent in paramedics (Regehr, Goldberg & Hughes, 2002). An additional psychometric measure was used for resilience. Additional questionnaires were also used to allow the experimental participants to provide feedback on the STDRT, as well as allowing all participants to provide feedback on the psychometric measures. This was to gain further information on the suitability of the measures. The participants had the option to complete these measures and questionnaires either in a booked room on the UCLan campus, or in their own time. For the latter option, all of these questionnaires were sent

via email on Microsoft Word with text boxes imposed upon them to allow them to complete directly on a computer. They could also print this and complete by hand if they wished.

7.16.1 Davidson Trauma Scale.

The DTS was used to assess PTSD symptoms resulting from acute trauma. The DTS was published by Davidson (2002) and provides 17 items to measure three main sub-scale of PTSD (Intrusion, Avoidance/Numbing and Hyperarousal) or two alternate sub-scales (Frequency and Severity) that complete a total score of PTSD. Each question is rated on a five-point scale (0-4) to give a total score of 136. These questions were also measured on a separate axis for Frequency and Severity, and both were rated out of 68. The three main sub-scales of PTSD (Intrusion, Avoidance/Numbing and Hyperarousal) were each composed of different clusters within this psychometric measure, and additionally were made up of both a frequency rating and a severity rating. As there were five questions relating to Intrusion, this possessed a total score of 40. The cluster for Avoidance/Numbing had seven questions, giving a total score of 56. The Hyperarousal cluster also contained five questions, giving a total score of 40. The questions are based on the participant's symptoms for the previous week.

The gold standard of PTSD diagnosis is to use a structured clinical interview delivered by a clinician (Kosydar-Bochenek, Lewandowski, Ozga & Woźniak, 2016; Weathers et al., 2013). However, a trained clinician was not available for this project. Additionally, in a study aiming to recruit a multitude of participants, a structured clinical interview would be very time-consuming overall (Kosydar-Bochenek, Lewandowski, Ozga & Woźniak, 2016). In research testing multiple participants, using psychometric measures without a clinical structured interview is a typical and accepted method among researchers (Kosydar-Bochenek, Lewandowski, Ozga & Woźniak,

2016). Therefore, the DTS was used. Prior to the selection of this psychometric scale, others were considered.

Psychometric measures for PTSD typically possess the advantage of being quicker and easier to administer than a structured clinical interview, making them more ideal for research with multiple participants (Kosydar-Bochenek, Lewandowski, Ozga & Woźniak, 2016). A disadvantage however is that they are not a gold standard for PTSD diagnosis, and can only provide a provisional diagnosis. Nevertheless, they are useful in providing estimates of PTSD prevalence in populations, researching relationships between PTSD and other factors, and monitoring changes in symptomology over time (Kosydar-Bochenek, Lewandowski, Ozga & Woźniak, 2016). These advantages make the use of a psychometric measure more suitable for the feasibility study than a structured clinical interview.

There are no PTSD psychometric measures in existence that are specific to this population. Nevertheless, other psychometric measures were considered. Given that paramedics are exposed to traumatic stimuli in a similar disposition to military soldiers, the possibility that psychometric measures specific to this population can be applied to paramedics was considered. There are two studies that have examined PTSD in paramedics and emergency medical personnel using psychometric measures specific to military populations; one from Iranmanesh, Tirkari and Bardsiri (2013) and another from Donnelly (2012). Iranmanesh, Tirkari and Bardsiri (2013) evaluated rates of PTSD in paramedics and hospital emergency personnel in South East Iran using the Mississippi scale for PTSD; a psychometric measure designed for male veterans of the Vietnam War. Their results suggested that PTSD was found in 94% of their participants and significantly higher for hospital emergency personnel compared to paramedics. The researchers noted that this was higher than previous studies, and possible explanations

included difference in instruments and sample size, different organisational structures, and different work volume across different countries.

Donnelly (2012) used the PTSD Checklist Military (PCL-M) to investigate correlations of PTSD with other factors in EMS personnel. The PCL-M is one of three variations, the others being PCL-Civilian (PCL-C) and PCL-Specific (PCL-S), of a psychometric measure designed to assess PTSD as defined in DSM-IV, specific to military soldiers (Wilkins, Lang & Norman, 2011). The study by Donnelly (2012) altered the language of the PCL-M, so that questions referring to 'military' were now replaced with 'stressful work experience.' Her study showed that this altered PCL-M had positive psychometric properties in her sample of EMS personnel, suggesting respectable levels of reliability and validity. Her study successfully rejected the null hypothesis and supports her theory that chronic stress, critical incident stressors and alcohol use were related to elevated levels of PTSD. However, as opposed to the study by Iranmanesh, Tirgari and Bardsiri (2013) that found greater levels of PTSD compared to previous studies using the Mississippi scale for PTSD, Donnelly's (2012) study found lower levels of PTSD compared to previous studies on EMS personnel. The literature on the use of military-specific psychometric measures for PTSD being used on paramedics is scarce and unclear, and further research would help assess the suitability and applicability of this.

Due to the lack of previous research using psychometric measures specific to the military, other psychometric measures were considered for this study. With the introduction of DSM-5 in 2013, the PCL-M as well as the PCL-C and PCL-S were replaced with the PCL-5 (Weathers et al., 2013). This psychometric measure is more similar to PCL-S and is designed to help diagnose PTSD as defined in DSM-5 (Weathers et al., 2013). The PCL-5 is suggested to be a psychometrically sound

measure of PTSD symptoms, as displayed in studies on military veterans (Bovin et al., 2016; Wortmann et al., 2016), war-affected refugees (Ibrahim et al., 2018) and college students exposed to traumatic events (Blevins et al., 2015). Out of the 20 questions in the PCL-5, seven of these were based on Criterion D, more than any other criterion for PTSD in DSM-5. As identified in Chapter 2, Section 2.7, the negative affective PTSD described in Criterion D is more closely associated with forms of PTSD from chronic exposure to trauma (Chu, 2010; Lanius et al., 2010) that is more commonplace in paramedics (Mildenhall, 2012a; Regehr, Goldberg & Hughes, 2002). In this respect, the PCL-5 may have been appropriate to use in this feasibility study on paramedic students.

Given that the PCL-5 is one of the few psychometric measures for PTSD based on the most recent version of the DSM, it may have been advantageous to use this. Diagnostic tools work more effectively and accurately when based on the most current diagnostic framework (Whiting, Costello & Williams, 2019). To date, there are currently few studies that have used this psychometric measure specifically with paramedics or similar workers. Several studies have used the PCL-5 on paramedics combined with other medical professionals (Shrestha, 2015), EMS personnel (Musso et al., 2019) and helicopter EMS personnel (Harenberg et al., 2018). The scarceness of such studies, especially specifically for paramedics, means the psychometric properties of the PCL-5 when applied to paramedics are questionable (Whiting, Costello & Williams, 2019). Additionally, the psychometric properties of the PCL-5 appear to be more specific to military populations and those exposed to an acute traumatic incident (Blevins et al., 2015; Bovin et al., 2016; Wortmann et al., 2016). Hence, this measure may not be entirely suited to the more chronic forms of mental distress experienced by paramedics.

While the study by Shrestha (2015) found high rates of PTSD in paramedics, this participant group were exposed to a natural disaster along with the patients that they were treating two months prior to the start of the study. The studies by Musso et al. (2019) and Harenberg et al. (2018) found low rates of PTSD for their samples of paramedics. Musso et al. (2019) found that their sample had a mean severity score of 22.55 using the PCL-5. While the cut-point score for this measure varies depending on the aims of research and population used, it is generally considered to be a score of 31-33. Similarly, Harenberg et al. (2018) found that only 5% of their sample of paramedics scored higher than 33 on the PCL-5. This may suggest that the psychometric properties of the PCL-5 is not equipped to measuring the form of PTSD associated in paramedics, and may results in floor effects. More research is required to further explore this. The ongoing study by Wild et al. (2018) proposes to use the PCL-5 in their sample of student paramedics. Studies such as this in the future will be important to evaluate the PCL-5 more. The PCL-5 was considered in this feasibility study to help further evaluate its suitability for paramedics.

However, the PCL-5 has several elements that mean that it is not ideal for this study. Firstly, the PCL-5 is required to be more stringent in its administration, making it less appropriate for this current feasibility study. The PCL-5 should be implemented and interpreted by a clinician, rather than a research student (Bovin et al., 2016; Weathers et al., 2013). Therefore, an alternative psychometric measure should be considered. And secondly, the PCL-5 contains a scale for the frequency of PTSD, but no scale for severity. Whiting, Costello and Williams (2019) argue that the absence of a severity scale in the PCL-5 hinders its usability in paramedics. The researchers state that psychometric measures identifying symptom severity are needed to measure forms of PTSD more typical in paramedics. Therefore, the PCL-5 was not chosen for this feasibility study.

Therefore, the DTS psychometric measure was chosen for a number of reasons. The questionnaire provides a quick measure, and is estimated to take around 10 minutes to complete. This was useful in order to not take up too much of the participants' time, and make them more likely to be willing to participate (Hoerger, 2010). Administration does not require any form of structured interview, unlike the structured clinical interview for DSM-5 disorders (SCID-5) (First & Williams, 2016) and can be administered by someone with an understanding of psychological testing and possesses awareness of the limitations of this type of screening. I was aware that the DTS is not able to confirm PTSD on its own, and is best used as supplementary alongside other measures such as interviews. It does however provide a general guide and a level of practicality suitable for this study.

Additionally, the DTS possesses scales for both frequency and severity of PTSD symptoms. This was proclaimed to be an advantage of the DTS compared to previous psychometric measures for PTSD when developed (Davidson et al., 1997). Whiting, Costello and Williams (2019) argue that the inclusion of measuring severity as well as frequency would make psychometric measures more attuned to measuring PTSD specifically in paramedics. This is due to paramedics being frequently exposed to chronic and vicarious traumatic events with more varying levels of severity.

The use of the DTS may therefore be more suitable for paramedic students. One aim of the feasibility study was to test this. The DTS has not been used often in previous research on paramedics and PTSD. Both the narrative literature review of this thesis (see Chapter 5), and a literature review by Jones (2017) for mental health in first responders (including paramedics) suggested that only one previous study to date that used the DTS in paramedics. The study was conducted by Fjeldheim et al. (2014), and recruited 131 paramedic trainees who were required to complete a number of

psychometric measures that were compared in a logistic regression analysis. Their study suggested that the DTS was reliable, with a Cronbach's alpha score of 0.96, and that 16% of their paramedic trainees met the criteria for PTSD, which is consistent with previous studies. Their study also successfully suggested relationships with other factors in their regression models. While the study by Fjeldheim et al. (2014) suggests that the DTS is an effective measure in studies on paramedics and PTSD, it is just one study. This feasibility study aims to further evaluate the effectiveness of the DTS in this population.

One point that can be raised is that the DTS is based on the DSM-IV, rather than the more recent DSM-5. To date, the only psychometric measure for PTSD as defined in DSM-5 is the PCL-5. I decided not to use the PCL-5 for the reasons stated above; relating to the requirement for a structured clinical interview and drawbacks in its design. I therefore aimed to evaluate the suitability of the DTS despite being based on DSM-IV in this feasibility study. Additionally, the DTS possesses questions relating to only acute psychological trauma and not chronic stress or trauma; an issue commonly found across psychometric measures for PTSD. Having a separate scale of severity as well as frequency may help in this regard (Whiting, Costello & Williams, 2019). Yet I was still concerned that this scale alone would not be sufficient to capture the complete nature of trauma exposure in paramedics. The DTS asks for only one critical incident to be given, and symptoms are based on the past week, rather than a longitudinal period. Therefore, a psychometric measure for chronic stress was also included (see Section 7.16.2).

One aim of the feasibility study was to evaluate if the DTS would be suitable for this population specifically. Psychometric properties have been obtained in previous research to help evaluate the DTS on a variety of other populations, which can provide a

more clear idea. They have reported that the DTS possesses good reliability and validity. The manual by Davidson (2002) used Pearson's correlation and suggested that the test-retest reliability of the DTS was good after a 7-day period between test 1 and test 2 ($r = 0.86, p < 0.0001$). Internal consistency, measured by a split-half test, was also good ($r = 0.95, p < 0.0001, \alpha = 0.90$). The manual also provided measures for convergent validity by comparing the DTS to other established measures of PTSD (Davidson, 2002). Significant positive correlations were established with both the Clinician-Administered PTSD Scale ($r = 0.78, p < 0.0001$) and the Impact of Events Scale ($r = 0.64, p < 0.0001$). Construct validity was similarly measured by comparing the DTS scores for those who had been diagnosed with PTSD via the DSM-III-R structured clinical interview ($M = 62.0, SD = 38.0$) and those who were not diagnosed ($M = 15.5, SD = 13.8$). The difference between the two groups adopted from the DSM-III-R clinically structured interview but additionally investigated with the DTS was statistically significant ($p < 0.0001$). Validity is a difficult concept to truly measure in social sciences, as it is dependent on the assumption that the other compared measures also possess validity (Bem & De Jong, 2013; Johnson, 2017). Nevertheless, this remains one of the best methods of attempting to attain validity.

There was no significant difference observed for ethnicity (Davidson, 2002). However, the majority of participants were Caucasian (168 out of 239), and the African-American population did appear to have more elevated levels of PTSD on graphical outputs. Having a more diverse sample might have helped highlight significant differences in ethnicity. There was a significant effect of age, with older participants possessing significantly greater scores. This is attributed to the Vietnam War, and accounts for the elevated scores in the African-American participants (Davidson, 2002).

7.16.2 Checklist Individual Strength.

An issue for this particular study I observed with the DTS is that the questions are strictly linked to acute PTSD rather than chronic PTSD. Only one critical incident is asked to be given. Therefore, the Checklist Individual Strength (CIS) was used to help assess the effects of chronic traumatology. The feasibility study aimed to evaluate if the CIS would be suitable for first year paramedic students. The CIS is a 20-item psychometric measure with each question being rated on a 7-point scale between 'yes, this is true' and 'no, that is not true'. This gives the CIS a total score of 140. A total score greater than 75 is reported to being an indication of high chronic stress (Bültmann et al., 2000). Within the 20 items, there are four subscales for different aspects of chronic stress: subjective feeling of fatigue, concentration, motivation and physical activity. These aspects are typically facets of chronic forms of PTSD such as CPTSD (Cloitre et al., 2013) and PTSD as determined by Criterion A4 in DSM-5 (Pai, Suris & North, 2017). The scale can be split into four different sub-scales to help obtain further information. For each subscale, the Subjective Feeling of Fatigue was rated out of 56, the Concentration was rated out of 35, the Motivation was rated out of 28, and the Physical Activity was rated out of 21. The participants score this psychometric measure based on how they felt during the past two weeks.

The CIS was designed by Vercoulen et al. (1994) to measure long-term fatigue resulting from work. Testing for this questionnaire was performed on a number of different workers of stressful professions along with psychologically healthy controls (Beurskens et al., 2000). The measure was originally made in the Dutch language, but has since been translated into many others (Panitz, Kornhuber & Hanisch, 2015). Only one study has used the CIS on a sample of paramedics (van der Ploeg & Kleber, 2003). This study also used other questionnaires to measure acute traumatology, but found that

chronic traumatology was higher for paramedics. Around 10% of paramedics in this sample displayed PTSD and high fatigue, and these were more strongly associated with external factors such as low social support, rather than acute traumatic events themselves. Thus, the CIS was included in this study to ensure that chronic aspects of work trauma were covered, using a tool already having been utilised with paramedics.

The CIS has been shown to possess good reliability (Aratake et al., 2007) and validity (Beurskens et al., 2000). Exact figures of these tend to differ depending on the language and country that the CIS is being used in (Aratake et al., 2007; Worm-Smeitink et al., 2017). The English version of the CIS has been tested for its psychometric qualities (Hewlett et al., 2011). Internal reliability was high ($\alpha = 0.90$) as well as test-retest reliability ($r = 0.81$). Validity was similarly good. Construct validity was measured by correlating the CIS with other similar measures such as depression, anxiety and arthritis symptoms. The CIS showed a low-medium correlation with other mental health measures ($r = 0.32-0.40$) and a low correlation with arthritis symptoms ($r = 0.18-0.30$). These low correlations suggest that the CIS is not inadvertently measuring aspects other than fatigue, but is fairly related to similar forms of mental distress. Criterion validity was also good, with the CIS showing a strong relationship with other established psychometric questionnaires for fatigue ($r = 0.61-0.81$).

7.16.3 Connor-Davidson Resilience Scale 25.

The Connor-Davidson Resilience Scale 25 (CD-RISC-25) was used to measure the psychological resilience of the participants. As with the DTS and CIS, the feasibility study aimed to test if this psychometric measure could be used in the study. This psychometric measure contained 25 questions related to resilience that could be rated on a 5-point Likert scale (0 = not true at all, 4 = true nearly all the time). Thus, the total score of the CD-RISC-25 is 100. The manual for the CD-RISC-25 outlines a large

number of studies that have tested the measure (Connor, 2012). Across a wide variety of nationalities and ethnicities, the CD-RISC-25 has shown to possess good reliability and validity (Connor, 2012). In previous studies that measure resilience in paramedics, the CD-RISC (including older versions) is the most frequently used (Fjeldheim et al., 2014; Froutan et al., 2018; Gayton & Lovell, 2012). Studies suggest that for paramedics with no known mental health issues, their resilience scores are in the range of that for the general population; between 60 and 80 out of 100 (Connor, 2012; Fjeldheim et al., 2014; Froutan et al., 2018). Gayton and Lovell (2012) suggest that resilience scores increase in experienced paramedics compared to student paramedics. However, in paramedics diagnosed with PTSD, this score has shown to be as low as 43.33 out of 100 (Fjeldheim et al., 2014). This is notably lower than other population groups that have been exposed to acute trauma (Connor, 2012). For instance, earthquake survivors were shown to have a mean CD-RISC-25 score of 66.4 (Blanc et al., 2016) while burn injury patients displayed a mean CD-RISC-25 score of 67.8 (He et al., 2013).

The manual for the CD-RISC-25 (Connor, 2012) provides a wide range of studies that help support the validity of the scale. The original study evaluating the older CD-RISC demonstrated that the scale had good test-retest reliability ($r = 0.87$). Other studies in a variety of different populations displayed a similar figure for test-retest reliability (Connor, 2012). Similarly, a number of studies using different populations showed that the CD-RISC possessed good internal reliability ($\alpha = 0.81-0.91$). The manual for the CD-RISC also had a wide range of supporting studies for the validity of the scale (Connor, 2012). Construct validity was measured by observing if measures of mental distress possessed a negative correlation with the CD-RISC. This effect was observed for a wide range of different forms of mental distress. For example, Wingo et al. (2010) found a significant negative correlation between the CD-RISC and the Becks Depression Inventory. The manual additionally measured convergent validity by

observing if the CD-RISC correlates with other resilience scales (Connor, 2012). This was displayed by positive correlations with the Kobasa Hardiness Scale ($r = 0.83, p < 0.001$) and the Sheehan Social Support Scale ($r = 0.76, p < 0.001$). This was further displayed by negative correlations with the Sheehan Stress Scale ($r = 0.32, p < 0.0001$) and the Perceived Stress Scale ($r = 0.76, p < 0.001$) (Connor, 2012).

7.16.4 Feedback Sheet.

In order to yield further information about the methodology of the study, all participants were given a feedback sheet at the end of the experiment (see Appendix 13). This was created by the researcher for the purpose of this study. There were two sets of feedback sheets; the experimental group received one requesting feedback on both the STDRT and the psychometric measures used in the study. The control group received one requesting feedback for the psychometric measures only, as they did not engage with the STDRT during the study.

The feedback sheet began with asking the participants for the dates that they have been on placement during their course. This was to allow myself to observe when they would most likely have undergone work stress and trauma. The feedback sheet then asked participants to provide feedback on the STDRT. This consisted of seven questions that were rated on a 5-point Likert scale and three questions where they could provide written, qualitative feedback. The experimental feedback sheet additionally had questions related to the suitability and efficacy of the DTS, CIS and CD-RISC-25, each of which was rated on a 5-point Likert scale. The control condition received a similar feedback sheet, but with the absence of the STDRT questions.

7.16.5 *Self-Taught Digital Resilience Training Guide.*

As the file size of the STDRT was too large to be sent by a conventional email, the STDRT was instead sent to participants using Dropbox. While this made the secure transfer of the STDRT over the internet possible, it did mean that this process might have been difficult to do for those not familiar with Dropbox. Therefore, a guide was made for the purpose of this study to help provide instructions to do this. To make the process clear, the guide used screenshots to help illustrate this as well as written instructions. The guide also provided help on using the STDRT itself. This was to help the participants to navigate the program effectively.

7.17 Ethics

Ethical approval was obtained from the UCLan STEMH Ethics Committee on 12/03/18. The unique reference number was STEMH 738. In line with ethical research procedures, the participants had the right to withdraw from the research at any stage, and their personal information was kept confidential and secure. This was further ensured by aggregating their data presented here, rather than providing their individual data. Permission to use the psychometric measures was obtained from the original authors or the respective copyright holders.

7.18 Procedure

Stage 1: The first stage of the study required the participants to complete the three psychometric measures (DTS, CIS and CD-RISC-25). This stage began on 4th April 2018. The experimental and control participants were treated the same in this stage. The participants had the option to complete the measures either in a booked room at the university campus, or in their own time. All responding participants chose the latter option. The participants were able to complete the three measures in any order

they chose. Request for demographic information for age and gender was already included in the DTS. Once the participants completed these, they were sent back to the researcher via email. As mentioned previously, a large proportion of participants dropped out at this stage. Of the 17 participants that signed consent forms, only seven completed this stage.

Stage 2: The second stage is the first point where the distinctions between the experimental and control participants were instigated. After the initial completion of the three psychometric questionnaires, the experimental participants were given the STDRT Guide via email and the STDRT through Dropbox with a link also sent in their email. The experimental participants were asked try and use the STDRT as often as possible within the next 6 months.

A 6-month interval was decided upon on the basis of pragmatic and practical considerations relating to the study participants' circumstances rather than purely theoretical grounds. As resilience is a more recent psychological concept that currently lacks a unified definition and relevant research, there is little research to suggest that any given interval length is most suitable. The studies included in the systematic review and meta-analysis for resilience training interventions by Joyce et al. (2018) have a lot of variation in the intervals they use. Of the 11 studies in their meta-analysis, five used 6-month intervals, and others used different interval lengths, such as 12 weeks. Ideally, a study should have frequent follow-up points, as some literature on resilience training programs suggest that the effect of resilience training may diminish over time (Vanhove et al., 2016).

The practical basis for a 6-month interval being used in this study was due to the schedule of the paramedic students. With stage 1 of this study being held on 4th April 2018, I was informed that the first-year paramedic students had little practical work

experience in paramedics at this point, with one Learning in Clinical Practice placement being scheduled in January. However, I was informed that the paramedic students had a second Learning in Clinical Practice placement from late April to late May, and across their summer break they would be undergoing practical placements as part of their course progression. Therefore, in the 6 months between the paramedic students completing stage 1 of the study in early April and returning to the university for their second year of study in October 2018, they will have gained more practical work experience, and would be more likely to have experienced critical work events. This therefore would best allow the effect of the self-taught resilience training from the STDRT to be measured.

They were also asked to not share the program with others, as this could have compromised the validity of the experiment if the control participants used it. The control participants did not receive the STDRT or its respective guide. Instead, they were made aware that they were in the control condition, and that they would not need to take any further action within this study for 6 months.

Within this 6-month interval, it may have been helpful to have used more data collection from the participants to assess engagement adherence of the STDRT, as well as psychometric measures on resilience, PTSD and chronic fatigue. Engagement with the STDRT was a potential parameter of the feasibility study, while monitoring resilience and PTSD symptoms would be useful as some studies suggest that the effect of resilience training diminishes over time (Vanhove et al., 2016). However, these were not undertaken during the 6-month interval. I did not want the feasibility study to be too time-consuming and deter participation. This is especially as a focus group I arranged earlier in the PhD project with second-year paramedic students yielded an initial 11 interested participants, but none of whom went on to sign the consent forms and

participate. Therefore, as I was aware that the paramedic students would be busy with placements between April and October, I did not want to deter participation by giving them more work to do over this period, other than ask them to engage with the STDRT as often as possible. Furthermore, obtaining ethical approval for this study from the UCLan STEMH ethics committee proved difficult, and I was required to be stringent and careful in how I conducted this research on a vulnerable population at greater risk to trauma exposure. The UCLan STEMH ethics committee preferred that if a paramedic student felt especially distressed on their placement, the UCLan counselling service would be their first point of contact, rather than the STDRT. The qualitative feedback sheets (see Appendix 13) contained questions based on STDRT use. Hence, the extent to which the participants engage with it could be drawn from this post-study. The implications and potential consequences of not monitoring engagement over the 6-month interval however will be evaluated in the discussion section.

Stage 3: Around 6 months after stage 1 of the feasibility study, stage 3 began on 16th October 2018. This stage was essentially a re-test of stage 1; all participants once again completed the DTS, CIS and CD-RISC-25 in any order they wished too. Additionally, the participants were given the feedback sheets to complete after completing the psychometric measures. All participants who completed this stage again chose to complete this in their own time and returned the measures using email. Two participants did not respond in this stage, leaving a final sample size of five participants included in the data analysis; three in the experimental condition and two in the control condition.

7.18.1 Data Analysis.

The study was primarily focused on observing how feasible it would be to conduct a larger-scale version of this study in the potential future. While the results

themselves are not too essential, it is important to get an idea of what statistical issues a large-scale study may face. In practice, the study aimed to observe if the STDRT would help improve resilience and reduce mental health symptomology in paramedics over a 6-month period. The control group who did not receive the STDRT participated to provide comparison. This time period consisted of two distinct stages (start and end) and three psychometric questionnaires were used. The DTS had five sub-scales (Intrusion, Avoidance/Numbing, Hyperarousal, Frequency and Severity) and the CIS has four sub-scales (Fatigue, Concentration, Motivation and Physical Activity). The CD-RISC-25 did not have any subscales. With the subscales included in analysis along with the total scores, this meant that there were 12 levels for the measures in total.

Therefore, a two-way mixed design MANOVA was used to observe the effect, if any, the STDRT had on the psychometric measure responses. The independent variables are the condition and time. Condition was a between-factor while time was a within-factor. The experimental participants and control participants were compared for their scores on the three questionnaires and their respective subscale, before and after a 6-month period. Thus, a mixed 2 (Group: experimental and control) by 2 (Time: start and end) MANOVA design was used, with 12 dependent variables (DTS Intrusion, DTS Avoidance/Numbing, DTS Hyperarousal, DTS Frequency, DTS Severity, DTS Total, CD-RISC-25, CIS Fatigue, CIS Concentration, CIS Motivation, CIS Physical Activity, CIS Total). SPSS Statistics software version 24 was used to perform this analysis. It should also be clarified that for the DTS and CIS, higher scores indicates greater mental distress, while for the CD-RISC-25, higher scores indicates greater resilience.

7.19 Summary of the Methodology Chapter

The methodology of the main research studies constituting this project have been explained and outlined in this chapter. The overall design was a sequential

exploratory study to develop a digital program to foster resilience, grounded in a qualitative study. This was then evaluated for the feasibility of a main trial in a quantitative study. I have then outlined the forms of qualitative methodology in the online forum study, and the quantitative methodology in the feasibility study. The disadvantages of using an online forum study were considered, but I nevertheless believed that the advantages would prove this study to be a successful and original aspect of my thesis. I additionally believed that the feasibility study would provide useful insight as to whether a main trial of the STDRT would be feasible, and also how to improve the methodological design of a proposed main trial. In the next chapter, I will outline the results of the online forum study, followed by the results of the feasibility study.

CHAPTER 8: RESULTS

8.1 Online Forum Study Results

The qualitative thematic analysis highlighted 1310 coded nodes. Through the use of both theoretical thematic analysis and inductive thematic analysis patterns and themes that constituted the qualitative data were formulated. Many of these helped provide myself with insight for developing the STDRT and understanding more about occupational trauma in paramedics. I shall present the key findings relating to occupational trauma, work stress, resilience and PTSD in paramedics.

The online study highlights some of the exceptionally distressing work events that paramedics experience, and this also provides insight into the related cognitions involved. The results also highlight the varying outcome success of CISD; a finding that previous research has additionally reported (Bledsoe, 2003). A novel finding from this study was the preference of using biological terminology and explanations of mental distress in paramedics as opposed to psychological. Further insight was also provided on how paramedics talk about mental distress and how they seek help from others, and how the role of empathy towards their patients influences the likelihood of the onset of PTSD. An interesting effect was also reported relating to how alert tones create physiological and mental distress.

8.1.1 Occupational Trauma in Paramedics and Emergency Services.

Many forum threads instigated by the paramedics and emergency workers themselves in this matter began with them describing their own experiences with occupational trauma. This often was coupled with the user then asking for advice, or venting emotions. Some of these were fairly distressing and emotional. These described events were grouped under a node in NVIVO as ‘Story’ and sub-nodes as ‘Critical

Incident’ and ‘Chronic Stress & Burnout’. Other ‘stories’ followed with comments from other users discussing their similar experiences. Across the three forums, this resulted in 297 ‘stories’ being coded in NVIVO under this theme.

Each story was different; hence they varied in their nature and relevance to this study. Some forum users provided accounts of acute traumatic work incidents. Others provided an overview of their general work life and how it had led to chronic stress and burnout. Many posts also did not provide complete clarity. Many posts described horrific work incidents that the user experienced, but gave little details about how they felt because of it. Some also described how they were feeling stressed and distressed due to their work, but did not describe the incidents that caused this.

In Figure 8.1, the forum user instigates a forum thread by outlining a traumatic work experience and suggests symptoms akin to PTSD. The forum user further asks for help from other forum users. Many forum threads began with a post similar to this; traumatic experience, symptom expression, and ask for help.

Figure 8.1

Forum post example: Expressing distress and seeking advice 1

2014	I had my first “bad call” and been unable to eat or sleep much. This involved two doa’s, a 10-month old pronounced dead at the hospital, and a 10-year old with amputation of their right arm but in stable condition. I’ve spoke to experienced medics who said I did everything that they would have done. I’ve ran pedi codes as a basic and they bothered me but not like this. The whole incident felt odd and I’ve revisited the wreck site twice and replayed it in my head and I know I froze for a second when I saw the baby. I know I’ll get past this but I just need help getting over this bump. Any suggestions?
Occupation: Paramedic	

For the example in Figure 8.2, we see the similar structure of stories; traumatic experience, symptom expression, and ask for help. However, in this example the forum user's story occurred five years before he began to experience symptoms and compose the forum post.

Figure 8.2

Forum post example: Expressing distress and seeking advice 2

2008 Gender: Male	<p>So the best place to begin is by telling everyone about myself. I'm a rescue worker since I was 16 and I love it! It was stressful though, just like any other job in the emergency service. I'm 22 now and I've recently started getting flashbacks and nightmares about a call I did when I was 17? A 12 year old boy had gone missing and we were searching the open country. It went on for two weeks, straight from 4am to dark, until the boy's body was found. I didn't find the body, but I was in charge of my unite team and we were all impacted by this search. As most rescue and emergency workers know, when you are in these situations you put up a wall. When we found the poor boy's body I let the wall down. And then on the way back to the station we got another call saying that there was another body in the river in the town. I jumped out of the van, ran down to the river and saw a body caught on the tree. I took my personal line and gave it to a cop. I made my way to body and could feel the hairs on my neck starting to stand up. I guess I was getting scared, but I shook my head and said "this is my job, get it done and think about how scared you are when you are back on dry land". I went out to get the body, but the damn thing rolled over, giving me a good look at the poor guy's face. I will never forget the eyes... Honestly they were looking right through me! I eventually managed to get it back to shore and he was pronounced dead. Five minutes later I was in a truck on the way to see a councillor at the fire station, but I didn't feel like talking to him because he wasn't there and didn't really have any idea what I went through or did. Worse still, I also didn't want to talk to my team because I didn't want to remind them of the search. But now I'm starting to jump when I'm asleep and have nightmares and I'm sure my girlfriend was tell you that my fuse is getting short. Is it too late to see someone? Does it sound like I should? Would it be a waste of time? Or do I need to find a way of letting it go?</p>
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In Figure 8.3, the forum user similarly instigates a thread with a story about work stress and trauma symptomology. However, in this case, the forum user expresses their distress about longitudinal work stress and chronic burnout, rather than one distressful incident. Examples such as this were not coded under the ‘Critical Incident’ sub-theme, but under ‘Chronic Stress & Burnout’.

Figure 8.3

Forum post example: Expressing burnout

2007 Gender: Female	I'm coming up to ten years and I've had all I can take. In the past I've had small bouts of burnout, but this one's crushing me. I simply don't care anymore and while I still provide the best care possible, it's just not fair to my patients. Physically, I feel like I'm slowly falling apart, and mentally this work is the biggest stress in my life. I'm not always a nice person to be around these days and I'm sure that 95% of this is because of the job. It's time to go. I love medicine, but I've had enough of EMS. I can't wait to leave and never have to step back in an ambulance.
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8.1.2 Debriefing and CISD.

The qualitative forum analysis provided the experiences and opinions that paramedics and emergency services have on CISD and debriefing. Like the research, this is very mixed. Some emergency responders said it was helpful, some said it was not helpful, and some claimed that it worsened their symptoms.

For Figure 8.4, the forum user recites a traumatic incident. The forum user then states that while CISD “did work”, he felt that alternate options were preferable. With this, the forum user concludes that CISD is helpful when not forced. While he does not state explicitly why, it is possible that he is referring to adverse effects of CISD being forced on those who do not prefer it.

Figure 8.4

Forum post example: Experience with CISD 1

2009	I was in a CISD after I was on a MVC that killed both my classmate and her sister. I would've preferred an informal talk with the older staff and counsellors in the engine bay, although the CISD did work.
Gender: Male	I think CISD is helpful, just as long as it not forced.

The example in Figure 8.5 similarly states that CISD can be beneficial when voluntary. The forum user also provides examples of environmental and individual differences that can affect the effectiveness of CISD. Thus, the forum user provides views on why CISD can produce polarising results.

Figure 8.5

Forum post example: Experience with CISD 2

2009	I'll be happy to answer any questions about CISD. Here's my take: It's not a bad thing if it's voluntary, and closed to everyone except those who were involved in the call, including dispatchers. Sometimes people show up who just want to be spectators despite not being involved in the incident. I think it should just be used to "vent"; if someone is really troubled by an incident they should see a mental health professional. I've found it to be more useful in rural areas where you might have volunteers who are part-time providers, and due to the low-call volume, they are not used to dealing with these calls and/or the patient is someone they know.
Gender: Male	

For Figure 8.6, the forum user advocates that CISD is a sensible option for someone seeking help with work-related mental stress. He also attempts to undo the stigma associated with mental illness. As well as stating that it "means you're a normal person", he also appears to subvert the typical language used by those who typically see mental illness as weakness. "Wimp", "unprofessional" and "can't hack it" are terms that would be more closely associated with an individual stigmatising mental illness.

Figure 8.6

Forum post example: Experience with CISD 3

2008	I would recommend attending a CISD, but remember to approach it with an open mind. If you disagree with something that someone else is saying, then speak up. Don't let others tell you how you feel. What you feel and how you deal with it is your business at the end of the day.
Gender: Male	It is completely normal to cry, get mad, get depressed or worried about your own family members. It doesn't mean that you're a wimp or unprofessional or not cut out, and they are NOT signs that you have suffered from PTSD. They are signs that you are a person with a healthy emotional reaction. And if you didn't get drunk, punch a wall or wake up somewhere strange, then you're dealing with it a lot better than many people I've worked with.

In Figure 8.7, the forum user provides his reasoning for how CISD may produce different results depending on the cognition of the recipient. Based on his experience, he states that a distressed individual worker should talk if they are “keeping it all bottled up”. He also states that talking when one does not want to can lead to PTSD development by “re-hashing the anxiety”. He also states that this however might work differently for chronic stress and burnout, but is not certain himself.

Figure 8.7

Forum post example: Experience with CISD 4

2008	If you feel like you're keeping it all inside and will explode, then you should talk to someone.
Gender: Male	The problem is that many people don't feel like it's all bottled up inside. They mostly over it, but if they're forced to talk about it, then they re-hash the anxiety, and it can lead to PTSD development.
Occupation: Paramedic	It might be different from EMS workers, as we have a series of multiple events over a long period time, but can't say for sure.

For Figure 8.8, the forum user similarly provides her reasoning for how individual differences, different cognitions and counterproductive therapy techniques can exacerbate PTSD in those attending CISD or similar therapies. She then advocates that in trauma recovery, the individual in question should have more influence of the direction of their therapy.

Figure 8.8

Forum post example: Experience with CISD 5

2008	One important factor in the onset of PTSD is a real or perceived loss of control or autonomy. In short, the person believes that they, or someone close, is in immediate danger of death or severe harm AND they have no control over it. When therapy is attempted, an important aspect that's often overlooked is that the patient NEEDS to be in charge of it. Well intended but damaging therapists will 'push' a patient to 'let it all out'. This worsens symptoms as the patient is again not in control of their situation.
Gender: Female	
Occupation: RN student	When people who have suffered a trauma and they CHOOSE to talk about it, it is vital that the listener tries not to control the conversation to produce 'therapeutic' effects. Individuals are experts on themselves, especially in trauma recovery.

In Figure 8.9, the forum user describes a recent traumatic work experience, and he/she asks for advice as to whether or not attend a debriefing session. The forum user at that moment is uncertain whether the debriefing will help or not. PTSD related symptoms such as recurring thoughts of the incident and insomnia is described.

Figure 8.9

Forum post example: Critical incident, PTSD symptoms and debriefing

2008 I've been told to speak to someone, and since I'm uncomfortable with talking to people face-to-face, I thought I'd try here. Any advice would be appreciated.

A few days ago, I attended a call where a 3 year old girl had been run over by a vehicle. There were lots of bystanders and a family screaming and crying. A bystander was holding c-spine. Head deformity, damage to eyes, and blood and brain matter pouring out of her ear were noted. She was initially breathing and then stopped. We started CRP immediately, put her in a ked and transported her to the hospital. We worked on her for quite a while but then she was pronounced. My supervisor wants me to attend a debriefing but I really don't want to go. I've never been to one before, and I don't want to be bawling my eyes out in front of everybody else. Apparently others who were there, police, coroner etc are going. If I go what would I expect?

I feel that if I leave it alone it will go away. I would rather not talk to anyone about it. I have trouble sleeping because I keep running it over my head and keep seeing the girl's face. I keep thinking about her family and how I would feel if I lost my son.

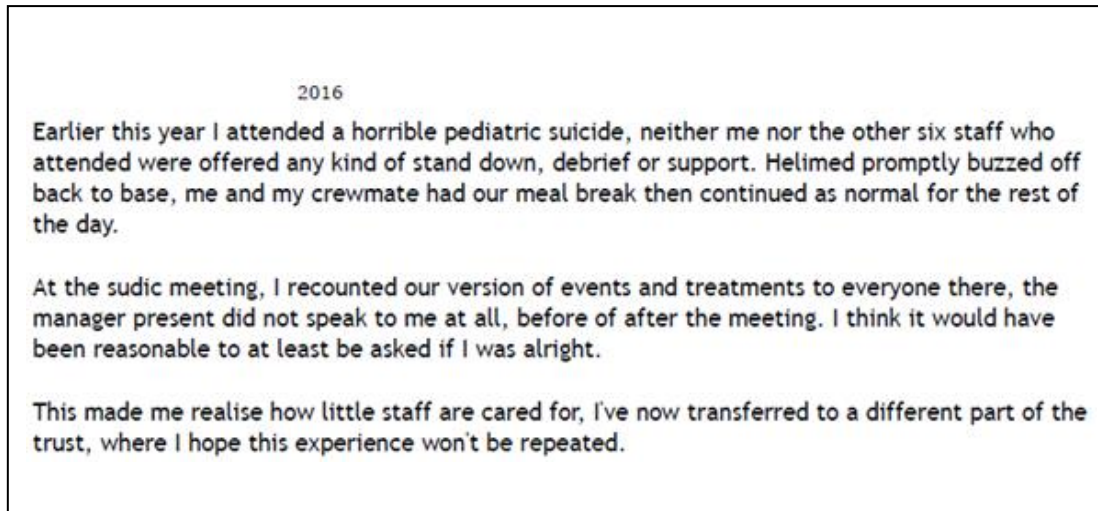
I don't know what I should do. People keep asking me if I'm ok. I just wish they would stop.

The forum user as seen in Figure 8.10 states that there was no support offered after a critical incident, which made them feel more distressed. It is possible that in cases such as these, CISD can help those who need support following critical incidents. It is however unclear whether a compulsory support system such as CISD would be more or less effective than a non-compulsory support system. For instance, it appears that if a co-worker asked if he/she were alright, then this would have made the user feel cared for. CISD is suggested to be less effective if it is viewed as a compulsory process

rather than being a way for friends and co-workers to display a genuine interest in support each other (Deville & Cotton, 2004).

Figure 8.10

Forum post example: Biological terminology 1



8.1.3 Biological and Psychological Language.

An interesting observation throughout the qualitative analysis was that the paramedic users had a tendency to describe psychological phenomena using biological terminology. For instance, when discussing depression, it was quite common for the users to discuss this in terms of it being a depletion of serotonin in the brain's neurons, rather than a psychological feeling of sadness and lack of motivation. However, this does not necessarily mean that paramedics did not use psychological language at all. Many paramedics in the online forums did use psychological language, particularly with the examples of the effectiveness of CISD.

In Figure 8.11, the forum user attempts to challenge the mental stigma frequently associated with mental illness. The forum user further criticises psychiatry medication and explains mental illness using biological terminology; "...it is a

DISEASE with a biochemical cause...” The forum user in Figure 8.12 argues that in the emergency services, psychological issues caused by work incidents should be treated the same as physiological injuries caused by work incidents. Similarly to the previous example, she uses an actively healing fracture as an analogy for psychological issues.

Figure 8.11

Forum post example: Biological terminology 2

2010	<p>Clinical depression is hereditary, like a physical illness, and is really a chemical imbalance (though I dislike that phrase; it’s so overused). It will not completely respond to lifestyle changes. I did psychotherapy for years with some of these patients, it was frustrating for me and them.</p>
Anonymous	<p>Another point: when someone is suffering from major clinical depression they literally cannot do these things. They can’t force themselves to make changes or “pull themselves up by their bootstraps”. It isn’t a weakness of character or lack of trying. It’s a DISEASE with a biochemical cause. Sure, it may be worsened by many other factors, but there are true brain changes in people with depression.</p> <p>Major depression can sometime result in psychosis and suicide. It’s a horrible disease, worse than many physical illnesses.</p> <p>The real problem is misdiagnosis and overuse of SSRIs. They don’t work with personality disorder, sadness, anger and lots of other things they are mistakenly prescribed for.</p> <p>I think the reason its difficult for so many to accept clinical depression as a disease is that we all like to believe we can use our minds to control our moods, otherwise we don’t feel in control.</p>

Figure 8.12

Forum post example: Physiological and psychological comparisons

2008 Gender: Female	I feel that if an employee is severely impaired, they should be moved, at least temporarily, from patient care. I completely agree that if an employee is having mental issues or is severely depressed, they cannot adequately care for patients, the same as with an employee experiencing any other physical health issues. You wouldn't expect a person with an actively healing fracture to be on the truck. Well, the same should go for psychological issues. However, we should view physical and psychological damage equally, and not condemn emergency service workers for having problems. I think if we become more proactive in treatment, we would see more content workers and also have better coping skills.
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8.1.4 Coping with Stress and Treating PTSD in Paramedics.

The responses by the paramedics provided some interesting insight into how to help manage and tailor treatments and preventions specifically to this population. For instance, exercise was frequently cited as a popular coping mechanism to help deal with stress. This was coded 47 times throughout analysis.

Within this research, thematic analysis was used to identify a number of different cognitive advice that were given by the forum users. One identified cognitive advice was noted as *realistic expectations*. Some users advocated that having realistic expectations about emergency service work beforehand would help one to not get burnout in the long term.




For Figure 8.13, the forum user describes her experiences with using exercise at the gym as a coping mechanism for work stress. She does further point out that this can be counterproductive and lead to injuries if done too intensely and incorrectly.

Statements pertaining to the beneficial effects of exercise in the mental wellbeing of paramedics are also displayed in Figures 8.14 and 8.15.

Figure 8.13

Forum post example: Work stress and coping mechanisms 1

Forum Crew Member

58 23 8

Education: EMT
Gender: Female

For mental health, I have used many outlets to help myself in times that are tough. I used to go to the gym but quickly found that my anger or frustration through the day was being transferred into my workouts, causing me to go too hard and causing injuries... The gym is a good place but only if you are in the right mindset. I have seen some of the most mentally unhealthy people at the gym coping with problems much bigger than they can handle because they "can just work it out at the gym".

Dealing with mental illness such as post traumatic stress and anxiety are hard in everyday life.. considering the busy schedule people have. In spare time I usually journal, read or play guitar, paint, draw,... but sometimes you can get into a slump and just feel terrible and not want to do any of those things. I consider myself proactive regarding mental health. I have only been in EMS 2 years and I see myself dealing with trauma everyday....

Figure 8.14

Forum post example: Work stress and exercise

Posted 2005 Report post <

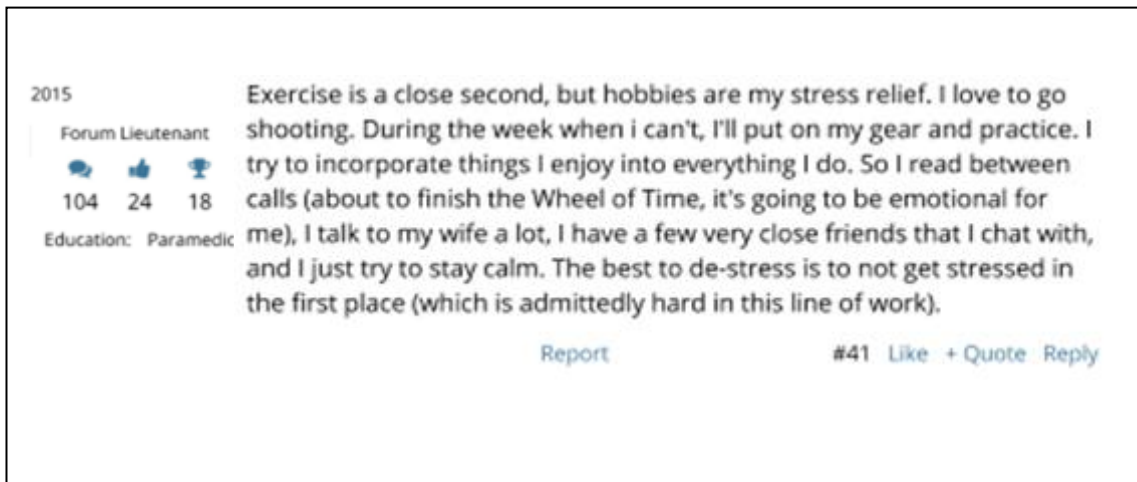
I run.

Running cures everything.

Long, slow, distance - 5, 8, 12 miles at a time. Nothing like spending 1.5 to 2.5 hours of quiet, solitary bliss. I can actually feel all the evil leaving my body - sweat drop by sweat drop...

Figure 8.15

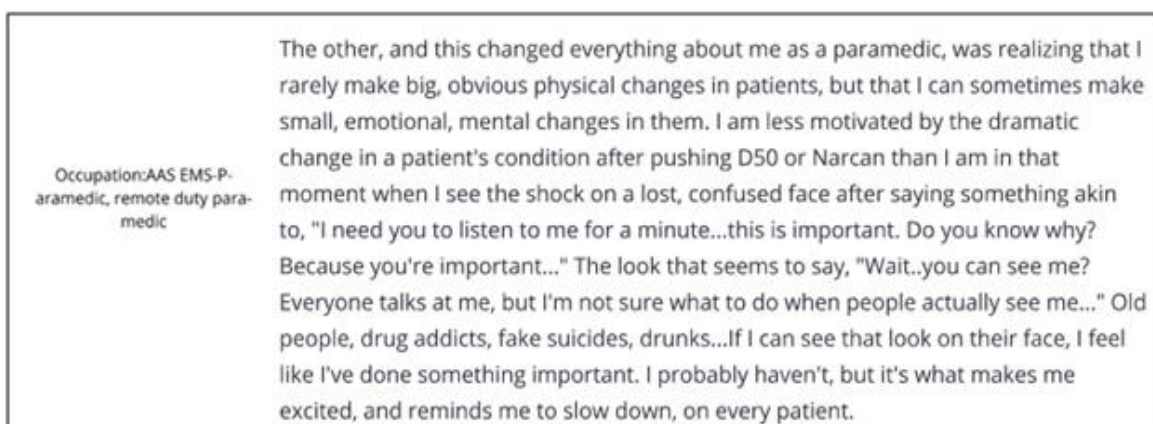
Forum post example: Work stress and coping mechanisms 2



The forum user in Figure 8.16 provides advice on how thinking about “the little things” and showing care for patients can improve the well-being of both the patient and the emergency service worker. The forum user from their own experiences suggests an alternate thinking pattern for treating patients that was coded as ‘Cognitive advice’.

Figure 8.16

Forum post example: Burnout and changing perspective



In Figure 8.17, the forum user provides a quote he gives to his/her students to prepare them for the tough profession. The forum user seems to believe that teaching their students this beforehand is important in preparing them for issues with their personal life suffering from their profession.

Figure 8.17

Forum post example: Managing expectations

Gender: Male Location: Central Oklahoma	There is a saying, I always tell my students.. after seeing so many choose EMS over family and even their own personal life. "You may love EMS; but EMS will never love you!"... this being; you may devote your life to this profession, but you will never receive the return. So place your time and effort into it, to become the best, but recognize the true ones that will love you back.
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In Figure 8.18, the forum user provides a potential cognitive perspective that emergency service worker can use to help deal with difficult calls. The forum user advocates that the emergency service workers should focus more on learning from difficult call than agonising over them.

Figure 8.18

Forum post example: Learning from experiences

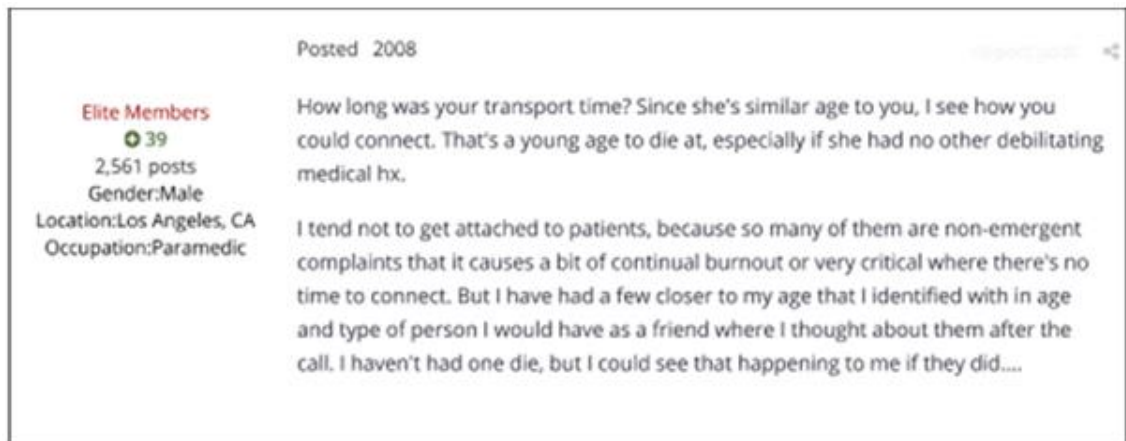
2010 Occupation: Retired Paramedic, RN.	<p>There is ALWAYS 'something else' that could have been done. It could be something you forgot, or something that you never learned. It may even be something outside of your protocols. Most times its just a complete shot in the dark that would have made no difference at all. But remember, there is ALWAYS something else that could have been done, so there's no point agonising over it because it makes no difference at the end of the day.</p> <p>Of course, that's not to say that you should not critically review each and every run; you should. But it IS going to happen. You can either deal with it or not. But your career depends on you discovering the method which helps you to do so. That's where the conversations such as this one are valuable. No one here can tell you how YOU should deal with it. We have no way of knowing what works for you. The best we can do is share what has worked for us, and you then go with your best instincts.</p>
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Similarly to *realistic expectations*, another notable cognitive factor highlighted in the qualitative analysis was *separate work life from personnel life*. This was represented in a number of different ways. Some users emphasised that paramedics should ensure that they have a personal life outside of the emergency service. This further relates other posts suggesting that paramedics should not “take their work to home with them”. Other posts argued that emergency service workers should not become too personally attached to their patients.

In Figure 8.19, the forum user states that attachment to patients may be increased if they are at the same age as themselves. He also states that he believes that attachment to patients can contribute to longitudinal burnout over time. His tone of language also suggests that acute trauma caused by a single stressful work event may be difficult to avoid.

Figure 8.19

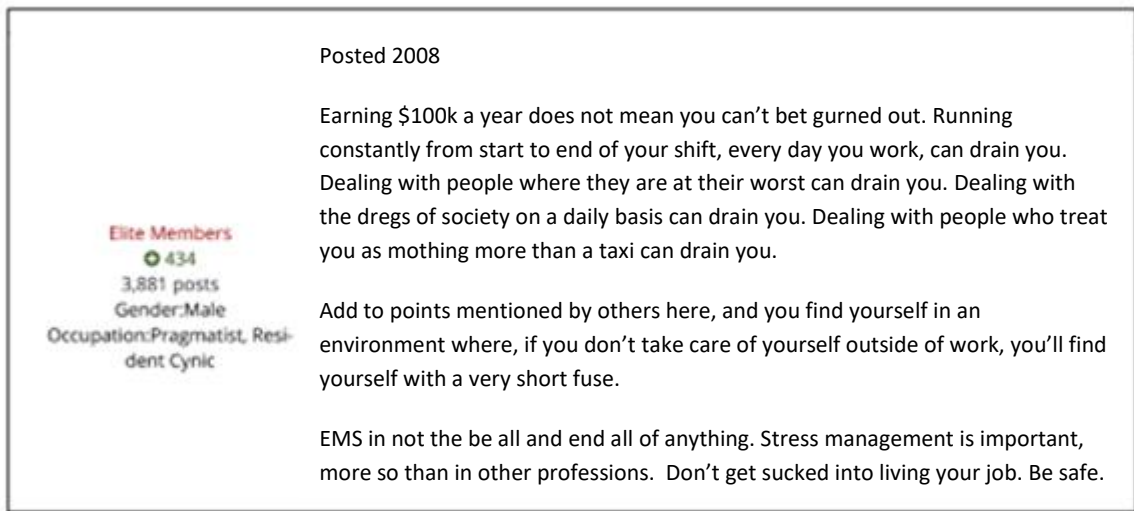
Forum post example: Personal attachment to patients



For Figure 8.20, the forum user lists a range of situations in which burnout can affect emergency service workers. He then states that coping mechanism include stress management and “not living your job”. A similar point is made in Figure 8.21.

Figure 8.20

Forum post example: Burnout and stress management



Posted 2008

Earning \$100k a year does not mean you can't be burned out. Running constantly from start to end of your shift, every day you work, can drain you. Dealing with people where they are at their worst can drain you. Dealing with the dregs of society on a daily basis can drain you. Dealing with people who treat you as nothing more than a taxi can drain you.

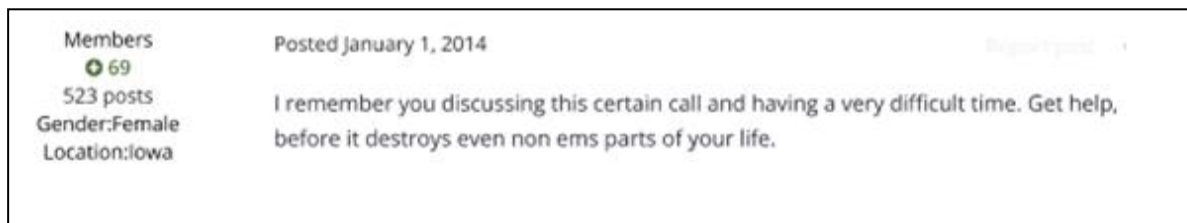
Elite Members
434
3,881 posts
Gender: Male
Occupation: Pragmatist, Resident Cynic

Add to points mentioned by others here, and you find yourself in an environment where, if you don't take care of yourself outside of work, you'll find yourself with a very short fuse.

EMS is not the be all and end all of anything. Stress management is important, more so than in other professions. Don't get sucked into living your job. Be safe.

Figure 8.21

Forum post example: Work and personal life 1



Members
69
523 posts
Gender: Female
Location: Iowa

Posted January 1, 2014

I remember you discussing this certain call and having a very difficult time. Get help, before it destroys even non ems parts of your life.

The forum user in Figure 8.22 argues that being overly attached to patients is not a healthy approach to emergency service work. The forum user appears to be trying to reinforce his points by using masculine language commonly associated with paramedics. An example is “...then you need to get the hell out this work ASAP”.

Figure 8.22

Forum post example: Attachment and emergency services

2013	I'd be careful with thinking that you have to be bothered by patient deaths to work in emergency services. It's things like that which lead to zealotry and also to people having severe issues with their job as well. If you're only doing this because you see yourself as one some kind of mission to 'prevent death' or 'save lives' or 'rescue people' etc, then that isn't a good thing either. Personally, I'd say that if that's your only motivation then you need to get the hell out of this work ASAP.
Gender: Male	
Occupation: Paramedic.	Death and disease are natural parts of life; just because someone isn't bothered by death, and can accept that this is natural, it doesn't mean that they shouldn't be doing this. There's a difference between having empathy for the dead and remaining survivors, and being upset and bothered about it. Just because we are supposed to help people, it doesn't mean you need to become attached to every patient to the point that you are letting things get to you

In Figure 8.23, the user states that as well as psychological help for especially traumatic jobs, there needs to be more work done towards either preparing paramedic students or filtering out less resilient paramedics with more stern recruitment strategies. This offers a different viewpoint; as well as helping paramedics after traumatic incidents more can be done beforehand.

Figure 8.23

Forum post example: Attachment and emergency services 2

2016	The ambulance service and, I believe, the universities put zero effort into ensuring that their staff are emotionally robust enough for the role.
	There needs to be support out there for those particularly traumatic jobs, but there are a lot of staff around, of varying degrees of clinical competence, who don't have the right temperament (or, related but not relevant to your field, motivations) to do the job.
	I believe that there would ideally be some form of psychological assessment of emotional fortitude as part of the recruitment process. I'm unsure how achievable this is, but my area bend over backwards to support our staff, and there are several colleagues for whom this will never truly be enough

8.1.5 *Talking and Seeking Help.*

Talking was one of the more frequent coping mechanisms coded in the forum analysis. This was coded for 115 times across 104 sources. Within this, the most common was *talking to other paramedics*. This was coded 47 times. Users often cited that they prefer to talk to other co-workers as they feel that they would understand their experiences more. Some also felt that talking to co-workers provided a more informal conversation about their problems with work stress. They preferred this to more serious, structured conversations such as that in CISD.

The forum user in Figure 8.24 explains that many paramedics prefer to talk to each other, as they believe that non-paramedics would not understand the experiences that they go through. The forum user advocates change to the UK paramedic system to increase support at work as opposed to finding support outside of work. The forum user additionally considers the potential for an online forum designed specifically to provide the opportunity for paramedics to talk to each other about critical incidents.

Figure 8.24

Forum post example: Staff support

2016

I think a better solution would be to change the systems to allow staff to access support at work - rather than something to be done in their own time.

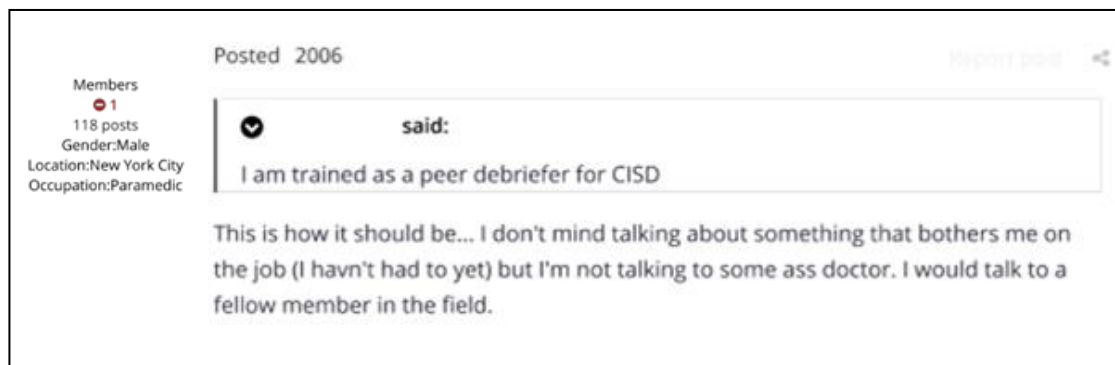
Most of us don't really talk about our experiences of trauma outside of work, as "unless you've been there you don't understand" - which has a lot of truth to it. I know if I talk about a horrible incident to other ambulance staff (or indeed other emergency services), they will "get it" in a way that others don't.

An online forum might work if you had people engaging enough and possibly professional input - people might be more willing to open up with a degree of anonymity.

In Figure 8.25, the forum user claims he would rather talk to another paramedic rather than a doctor. The forum user expresses this using fairly strong masculine language that appears to be an extreme of the masculine culture associated with paramedics. The phrased example is “...but I’m not talking to some... doctor.”

Figure 8.25

Forum post example: Talking to other paramedics 1



The forum user in Figure 8.26 provides advice on improving access to help with traumatic work stress. One point is to seek a mentor within the profession. The other is to form a support group within their organisation. It appears from these pieces of advice that many paramedics may have to actively seek help in their workforce if they need it, rather than having a support system already in place for them. A similar point is made in Figure 8.27.

Figure 8.26

Forum post example: Talking to other paramedics 2

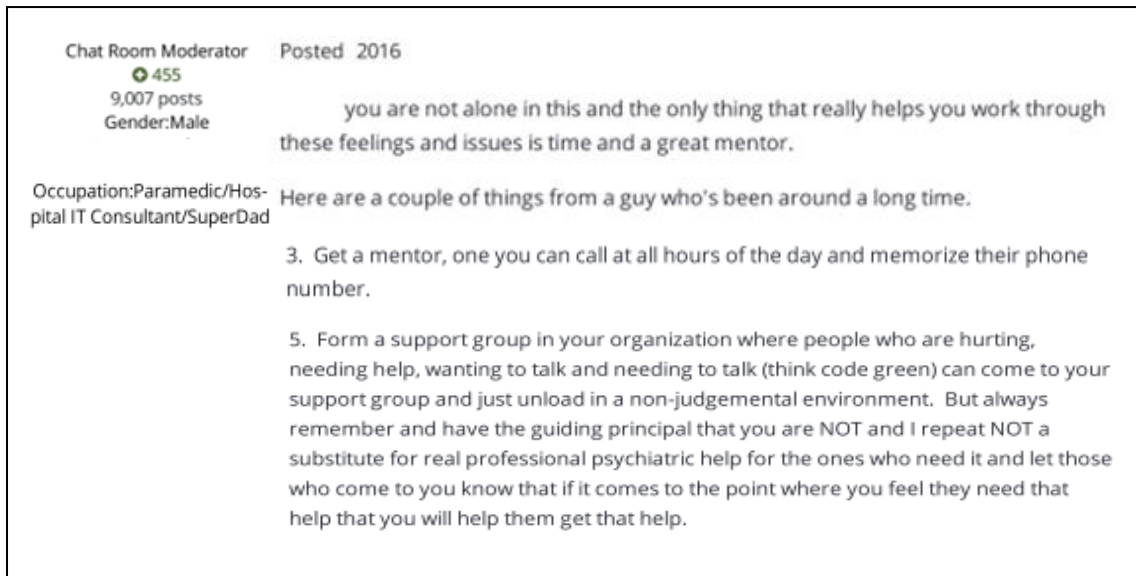
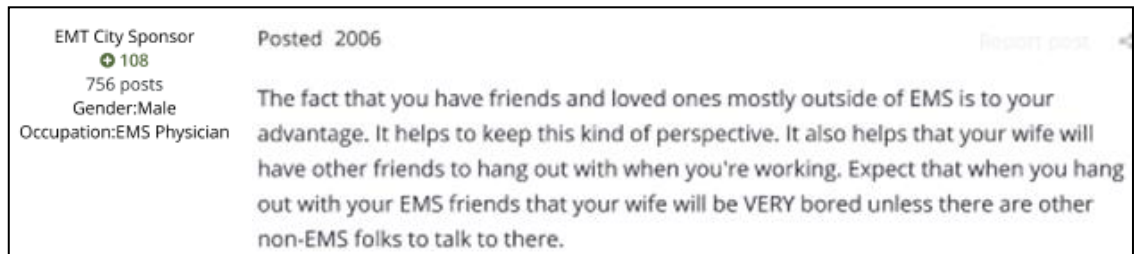


Figure 8.27

Forum post example: Work and personal life 2



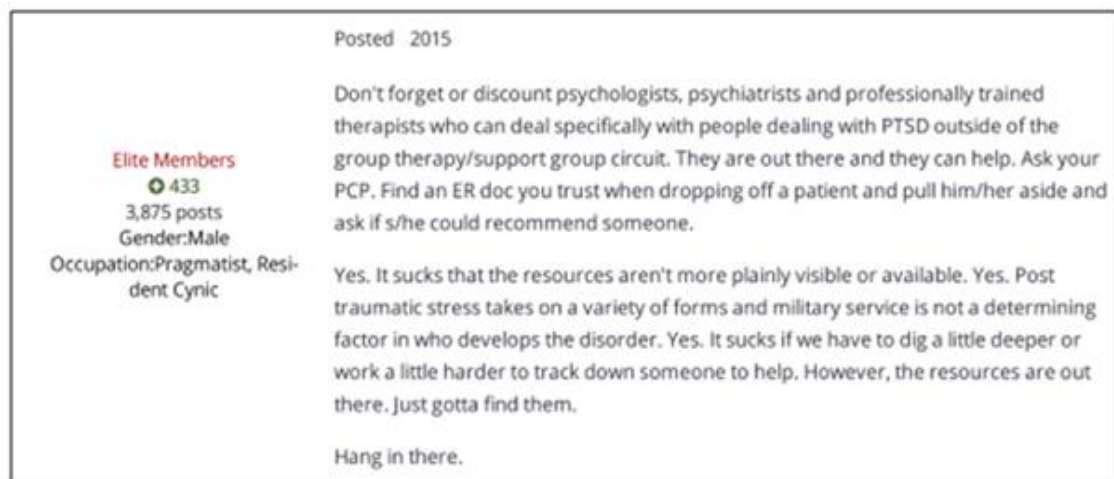
Talking to family and friends was also noted as a frequent coping mechanism in the forum analysis. This was coded 25 times across 18 sources. While this apparently has the disadvantage of friends and family not always being able to completely understand the work stresses of a paramedic, they can provide a distraction and a change in environment from emergency services, which can be beneficial (Pucci, 2017). Additionally, the online forums themselves were a commonly cited method for paramedics to talk about their issues with work-stress. They are essentially talking with other paramedic, except to paramedics that they do not necessarily know. Paramedics

were often encouraged by other users to send them private messages if they wished to talk more about their stress-related experiences.

In Figure 8.28, the forum user advises that psychological help from professional therapists is also a sensible option for those who may need it. He does further mention that “the resources are out there. Just gotta find them”. Once again, resources seem to be more available for paramedics who are actively seeking them, rather than being easily accessible to begin with.

Figure 8.28


Forum post example: Seeking professional help



The forum user in Figure 8.29 outlines their reasoning for why mental health issues are not debated much in paramedics. The forum user believes that the masculine work culture within paramedics and other emergency services largely contribute to this. The forum user further provides examples of the long-term consequences of this, such as drug use, early retirement and “...their mind/spirit in shambles”. While the forum user believes that prior mental resilience training may help, he/she seems to believe that the “deeply ingrained” masculine culture needs to change primarily to help overcome this issue.

Figure 8.29

Forum post example: Discussing mental health in paramedics



Herein lies one significant problem within EMS. You made a solid post, identified a very real issue, desire to study it and are going about it all the right way. Yet you have zero responses. However, if I were to post which "stethoscope should I get" or "which batman utility belt should I buy" there would literally be dozens of replies within hours.

Mental health in my opinion is overlooked (somewhat intentionally) within our field and I will even expand this to our Fire Services as well. There are many reasons for this some of which are machismo, career ender if I say anything, perception of weakness, martyr complexes, super human complexes, and so on. This field itself and the characters it attracts is fascinating unto itself.

Regardless, I would love to see some training/education/techniques in a proactive and positive format as opposed to all the crap that goes on afterwards/re-actively. I do think aside from eating our young, those who survive the feasting are then set up for ultimate failure. I have seen it on these forum and others over the years...if anyone laments about how bad they feel, there will always be someone who chimes in and essentially says "suck it up" or "this is not the career for you". We pride ourselves on being tough, mentally strong and able to see and deal with anything. There are those among us who know we need a life outside of EMS with positive hobbies and non-medical circles of friends. There are those among us who turn to drugs, alcohol or vice of the day for solace. Then there are those who leave the career or leave the planet, their mind/spirit in shambles.

It is not all doom and gloom, many of us do recognize the value of mental wellness as much as we value our physical wellness. I have seen a trend in my 20+ years of EMS where it has become "ok" to speak up or seek help. Employers make resources available and do not penalize those who seek them. However, as much as I have seen some positive action, I still see a deeply ingrained culture of "we do not need that mumbo jumbo pansy wansy shyte"...

8.1.6 Alert Tones.

During the qualitative research, it was found that a number of participants claimed that due to their work in the emergency services, they experience anxiety and an increase in heart rate when they hear loud tones similar to that which is used in their service.

In Figure 8.30, the forum user expresses physiological symptoms of heart rate elevation when hearing ringing caused by everyday electronics. This is apparently a result of the ringing of station alert tones still having a profound physiological affect despite being outside of work. A similar observation is made in Figure 8.31.

Figure 8.30

Forum post example: Loud tones and heart rate 1

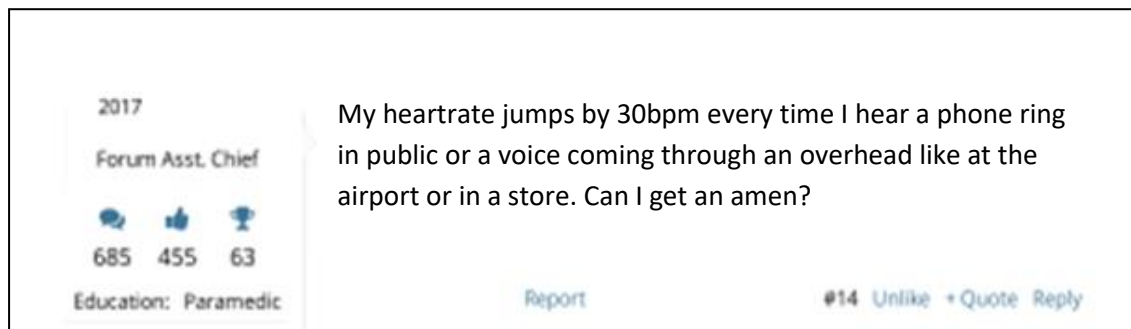
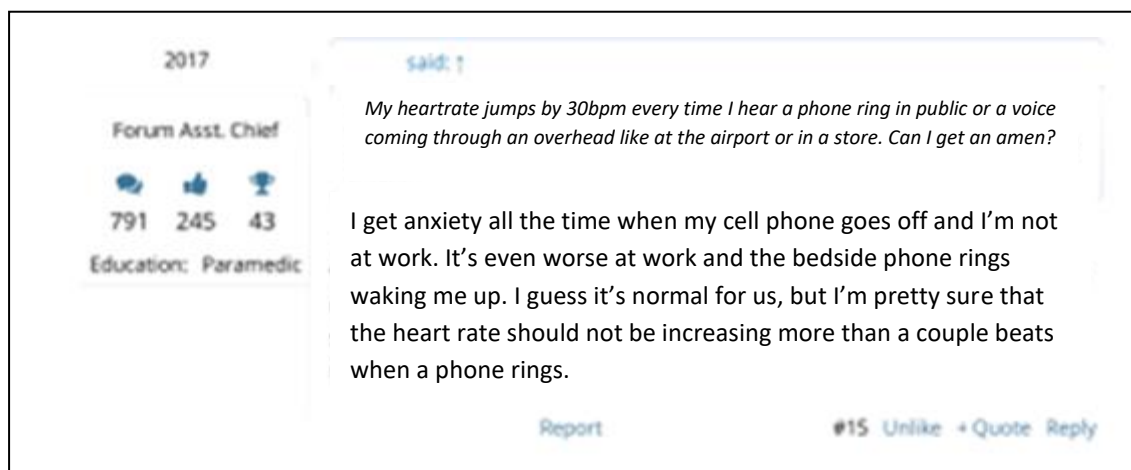


Figure 8.31

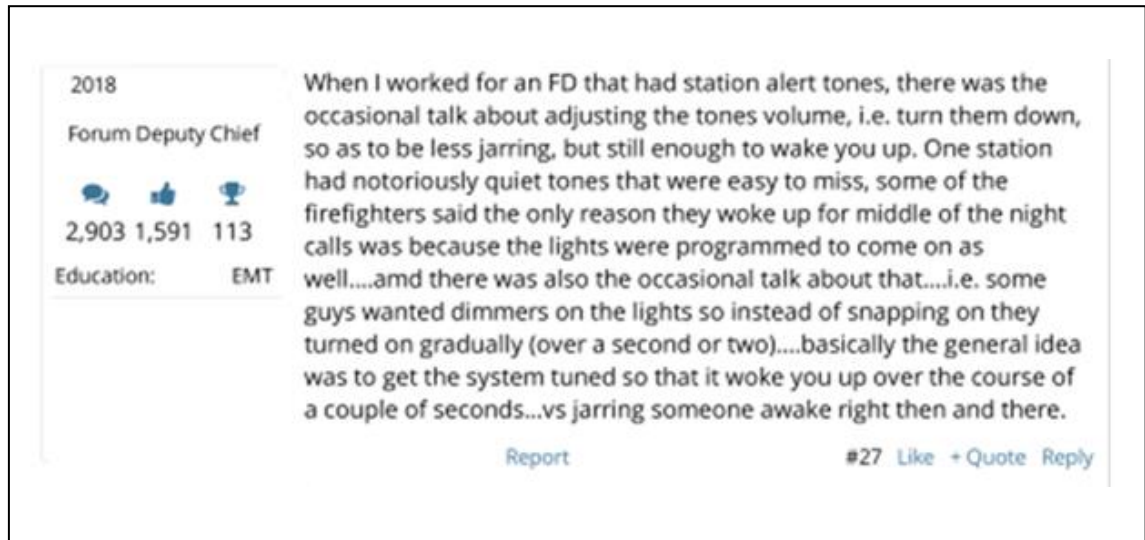
Forum post example: Loud tones and heart rate 2



The forum user in Figure 8.32 discusses his/her previous station's idea to change alert tones to make them less jarring. It appears the issue was finding a balance between not distressing the workers, and ensuring that the workers did not miss the tones. This idea did not seem lead to any experiments to test these different tones.

Figure 8.32

Forum post example: Work tones



8.1.7 The Role of Empathy.

Research in this area has not been able to sufficiently make clear the role of compassion and empathy towards patients in the onset of mental distress. On the one hand, some researchers suggest that this allows distressed individuals to process traumatic events in a healthy manner (Cacioppo et al., 2015; Grevin, 1996). On the other hand, some researchers suggest that this makes individuals more vulnerable to mental distress through secondary traumatization (Regehr, Goldberg & Hughes, 2002). The forum posts from the paramedics helped to provide some further insight.

From the qualitative research, it seems that many paramedics believe that empathy towards patients is the root of mental distress in the job. In their view,

paramedics should perform their work with little or no empathetic connection to their patients in order to avoid trauma, PTSD and burnout. Furthermore, paramedics who become attached to patients who are severely injured or pass away will be more vulnerable to mental distress according to this view.

Figures 8.33 to 8.37 contain examples of paramedics who in various terms suggest that paramedics function best, both professionally and emotionally, when they have minimum attachment to the patients they treat. The forum post in Figure 8.33 for instance describes the death of a patient as simply a feeling of distress that paramedics are expected to move on from using their own methods. Likewise Figure 8.37 argues that as death is an inevitable factor in paramedics, they should not allow themselves to become overly disturbed by this.

Figure 8.33

Forum post example: Empathy 1

	Posted 2012
Gender: Male	It seems normal to me. Patient deaths rarely bother me. Once they're dead, they're not in pain and cognizant of their death. No suffering, no fear, no nothing. It's similar to being unaffected when walking by a graveyard. You never knew them as conscious beings.
Location: Los Angeles, CA	
Occupation: Paramedic	Seeing the family grieving on the other hand, that really bothers me. It's the absolute hardest part of the job for me.
	I will say that the longer you're with a patient and you feel like your actions might really affect the outcome of the patient, the more death affects you. Even more if they were alert and orientated at the start of the call but even then it's minor.
	I've taken a personal moment for different patients, usually paediatric arrests. but it's a rare exception, not the norm.

Figure 8.34

Forum post example: Empathy 2

	Posted 2006	Report post
Gender:Male Location:NE Kansas Interests:EMS, Law Enforcement	<p>First loss, we all deal with them differently as you maybe can tell by reading all the posts. We do pretty much share one thing in common which is the fact that WE are the grief counselors for these families when deaths do happen. We are there in a supportive role after the last breath is breathed. How you deal with your first loss is up to you. If you've properly prepared yourself throughout your training period and your life, you maybe able to look at it as a simple fact and move on. If you're an emotional person, it might affect you in a bad way. In this job for me, you have to take emotion out of it while the patient is alive. I can't tell you how many times we've have a critical patient and by the time we fly them out of leave them at the hospital I don't even remember half of what was done, you just go into automatic pilot. To answer your question honestly, this is how my first loss affected me, I don't even remember it. I can't tell you who, when, where what anything like that. I can tell you my first loss as a student, a code that was brought into the ER and the family was there while I was doing CPR. It was kinda emotional, but you gotta keep those feelings under tight control until you are away from the scene.</p>	

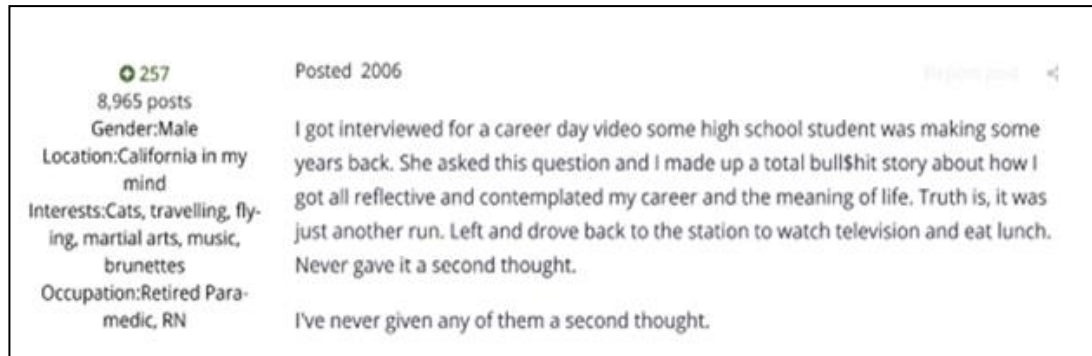
Figure 8.35

Forum post example: Detachment from patients 1

	Posted 2016	
Chat Room Moderator 455 9,007 posts Gender:Male Location:Somewhere over the rainbow Occupation:Paramedic/Hospital IT Consultant/SuperDad	<p>Chris, you are not alone in this and the only thing that really helps you work through these feelings and issues is time and a great mentor.</p> <p>Here are a couple of things from a guy who's been around a long time.</p> <ol style="list-style-type: none">1. First off - let's get the cliché out in the open - remember it's not your emergency it's the patients. God how I hate clichés and stupid EMS sayings but this one above all others, is really spot on. Remember this one when the shit hits the fan, it's not your emergency, unless you are becoming the victim. Then of course it's your emergency too.	

Figure 8.36

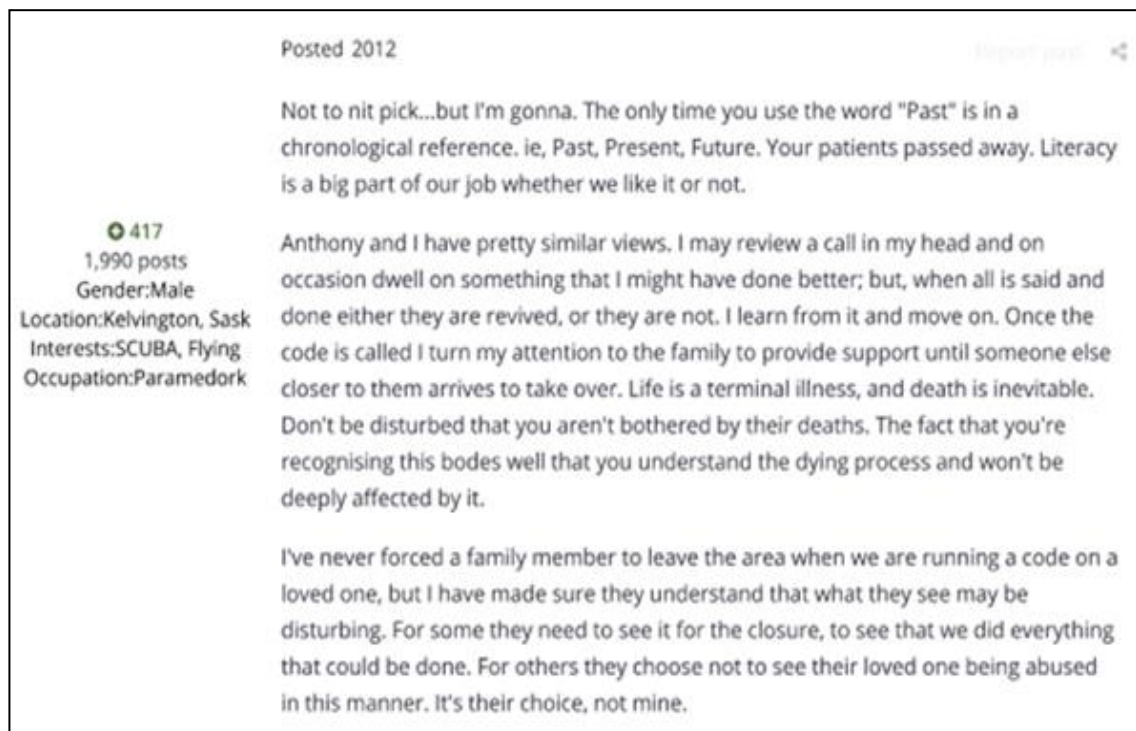
Forum post example: Detachment from patients 2



The screenshot shows a forum post from 2006. On the left, the user's profile information is displayed: a green circle with the number 257, 8,965 posts, Gender: Male, Location: California in my mind, Interests: Cats, travelling, flying, martial arts, music, brunettes, and Occupation: Retired Paramedic, RN. The post text reads: "I got interviewed for a career day video some high school student was making some years back. She asked this question and I made up a total bull\$hit story about how I got all reflective and contemplated my career and the meaning of life. Truth is, it was just another run. Left and drove back to the station to watch television and eat lunch. Never gave it a second thought. I've never given any of them a second thought." A "Report post" link is visible in the top right corner.

Figure 8.37

Forum post example: Detachment from patients 3



The screenshot shows a forum post from 2012. On the left, the user's profile information is displayed: a green circle with the number 417, 1,990 posts, Gender: Male, Location: Kelvington, Sask, Interests: SCUBA, Flying, and Occupation: Paramedork. The post text reads: "Not to nit pick...but I'm gonna. The only time you use the word 'Past' is in a chronological reference. ie, Past, Present, Future. Your patients passed away. Literacy is a big part of our job whether we like it or not. Anthony and I have pretty similar views. I may review a call in my head and on occasion dwell on something that I might have done better; but, when all is said and done either they are revived, or they are not. I learn from it and move on. Once the code is called I turn my attention to the family to provide support until someone else closer to them arrives to take over. Life is a terminal illness, and death is inevitable. Don't be disturbed that you aren't bothered by their deaths. The fact that you're recognising this bodes well that you understand the dying process and won't be deeply affected by it. I've never forced a family member to leave the area when we are running a code on a loved one, but I have made sure they understand that what they see may be disturbing. For some they need to see it for the closure, to see that we did everything that could be done. For others they choose not to see their loved one being abused in this manner. It's their choice, not mine." A "Report post" link is visible in the top right corner.

The forum posts in Figures 8.38 to 8.43 on the other hand suggest a different perspective. These forum posts argue that feelings of distress due to the empathetic connections with patients are a natural aspect. The post in Figure 8.40 argues that avoidance may even result in greater distress in the long term. The other forum posts

advocate the use of coping mechanisms to help deal with these incidents more healthily, as well as also emphasising the importance of time in recovery and processing events. The forum research, likewise to the research literature, also provides mixed evidence towards the role of empathy in the critical incidents that paramedics face.

Figure 8.38

Forum post example: Coping mechanisms for processing work incidents

	Posted 2007
Gender:Female Location:Sometimes in Dry-fork, WV Sometimes in Arthurdale, WV Interests:Volunteer firefighter Paramedic Ski Patrol Working on vintage sports cars Triathlon/working out	<p>the call still bothers me. first shift ever as an EMT, first call - suicide. PD had to force the door, guy lying prone, barely breathing, etc. we worked him until the ED. the crew chief wanted me to watch what the ER docs did to him. I also read the note he left. apparently wife left him, kids left for college and he felt he had nothing to live for. He took two bottles of pills and waited to die. Not sure how we got the call (who called 911). he lived. not sure what kind of life he had afterward. that was 12 years ago. i remember it like yesterday.</p> <p>I write in a journal to try to purge my memories. its like closing the book on a call. i know it doesn't work for everyone and I'm sure some psychologist out there probably thinks I'm nuts for doing it, but its my way to achieve "closure". if i don't write this stuff down, it eats at me, even after CISD and talking to every tom, dick and harry. writing seems to be the only thing that works for me. i'm glad i found it early in my career.</p>

Figure 8.39

Forum post example: Learning to cope with trauma

Chat Room Moder. ● 0 508 posts	<p>My first code? It was a bit rougher for me and will admit I went into a good depression for a short period afterwards. I really got to know that patient before the arrest took place and we knew the parents quite well as well so that didnt help. I do know we did everything we could do so in that sense I never felt bad BUT...my partner and I played Mario Party and ate junk food the rest of that night. We were both in a daze for quite some time before everything sunk in and we moved on.</p> <p>I don't think you ever get used to it, but you do find more ways to deal with them and will learn from each experience. Part of life. Babies are born, and people die.</p>
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Figure 8.40

Forum post example: The consequence of avoidance

2,219 posts Gender:Male Location:Lost in Rural AB Occupation:Internet Whacko	<p>But this brings great responsibility. like the responsibility I feel as I back up a crew with a pregnant trauma victim, and they look me in the eye and say "thank god you're here" as if I am going to ensure she will survive.... she didn't.</p> <p>Or the responsibility I feel when I get that Difficulty breathing call wondering if this will be the tube I miss, with backup many many miles away. But this is not exclusive to me. Yes I may be in an extreme setting, however those in air medical have similar resources. Even a overworked city ambulance may not have backup available.</p> <p>These are the regular stresses of the job. The problem is, if you do not deal with them, one day... they sneak up, and tear you down when you least expect it, just as they have done to me.</p>
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Figure 8.41

Forum post example: Putting into perspective

Gender:Female	<p>Posted 2006 Print post <</p> <p>How do I handle the losses? By reminding myself that I (and my partner) did everything in our power to save them and that sometimes, all the skills, meds., and prayers in the world aren't going to stop the inevitable. You can't save them all. Many times, it's the elderly or chronically ill and I put it into perspective. Chances are they led a good, full life. Hopefully they have family that loved them beyond words and they passed knowing this. For those who are terminally/chronically ill, I just remember that they're no longer suffering. I usually have a feeling that I can't put into words that, out of all of the people that loved them, mine was the last face they saw, the last voice they heard. I consider it an absolute honor to be with these people at the end of their lives.</p>
---------------	--

Figure 8.42

Forum post example: Learning over avoidance

	Posted 2012	Report post <
Gender:Male Location:Colorado Springs, Colorado Occupation:AAS EMS-P- aramedic, remote duty para- medic	Also, this is a really good time for you to learn to think and act when faced with those kinds of nervous feelings instead of checking out and hiding. Much of EMS involves those types of nerves at one time or another. Instead of trying to eliminate those feelings, maybe try to learn and train within them before they're gone? They won't last long, and then the opportunity will be lost. Good luck!	

Figure 8.43

Forum post example: Learning from critical incidents

	Posted 2007	Report post <
581 posts Location:Look North	I still remember my first pedi-code like it was yesterday. 4-months, still when ever I smell baby powder I think of her. I remember her name, her birthday, everything about the call is still plain as day. I now think about it when I choose to. It did consume me for a while. I wanted to quit, never come back again, just pack it in. I was lucky there were people who had been through similar circumstances that helped me learn to deal with it. To be able to keep it in perspective. Who knew the traits and signs of someone that could be in trouble. For a while every kid I saw around her age made me think of her, those feelings would come rushing back, maybe there was something more we could have done, maybe if we did things differently. Those feelings do eventually subside. You will realize it is part of this field, not a big part, thank god, but a part none the less. That there wasn't anymore you could have done. Like has been stated in this thread numerous times. Kids die, yeah it sucks. However its part of life. If you choose to stay in EMS, which I hope you do. You will have more bad ones. You have to be able to get by them. You don't have to forget them, just be able to survive them. Some people don't. I have seen EMT and medics with years of experience walk out the door and never come back. It does happen. If you learn to deal with it now, and keep it in perspective. You will not only will recover from this call, you might be able to help others recover from theirs. Good luck.	

8.1.8 Differences Between Urban and Rural Areas in Work Stress and Critical Incidents.

A recurring theme of the online forum research appeared to be the difference in work stress and critical incidents between paramedics working in urban areas and paramedics working in rural areas. It appeared that paramedics situated in urban areas were faced with chronic stressors throughout their profession due to a greater volume of calls from working in more populated environments.

In Figure 8.44, the forum user discusses their experience of how they have experienced burnout from working as a first responder in a highly populated city. The forum user largely explains this effect as being the result of the body losing its ability to assimilate adrenaline.

Figure 8.44

Forum post example: Burnout in a large city 1

2006	<p>Maybe some of you have heard of the phase 'adrenaline junkie' before. I am retired after 25 years of work In EMS and firefighting in Ontario, Canada. It's a large city metro of over 3 million people. Very busy.</p> <p>I wanted to talk about the adrenaline rush situation and how it is related to burnout, and the importance of recognising it. When you first start the job, everything is great, the alarm goes off and you go as all other first responders do. Your heart starts racing and the adrenaline kicks in. This is quite a rush and this is repeated for years.</p> <p>But as we age, the body has had so much adrenaline through the system that it finally gets to a point where it cannot assimilate it any longer. This is when problems begin; Burnout. It can take the form of nausea, or not wanting to be responding to the all even while you're already en-route to it. While there are other signs, these two are the main ones. If you reach the burnout stage, it needs to be recognized and dealt with. Early retirement is best if possible. If not, consider switching department to a less intense area, or service that is not first responder related.</p>
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Figures 8.45 and 8.46 provide examples of how working in the emergency services in a busy city can have negative long-term impact on the individual workers. It appears that working as a paramedic in areas with large populations means having both more workload and more exposure to deaths and serious injuries. Consequences appear to include burnout and impacts on one's career and personal relationships. Proposed coping mechanisms include humour, a positive relationship with co-workers and potentially relocation to stations in "slow rural" areas as opposed to busier cities. The forum users also provided insight into the challenges faced with working as a paramedic, as well as other first responders, in rural areas. Some of these may differ from the challenges from working in urban areas, and the negative consequences may also differ.

Figure 8.45

Forum post example: Burnout in a large city 2

I have been a paramedic for 8 years now for a busy company in the city. During my time I have lost many patients, some of them I remember like it was yesterday. And some I do not remember.

Not everyone can do this job. We walk a fine line between real and crazy, I think. You have to do the job the best you can and you can't take it home with you. You have to be able to find humour as well. I wouldn't have lasted this long without my fellow paramedics. I can turn to them, and they all understand how it feels to lose a patient, save one, the frustrations in this job.

Burnout is big where I am, shifts are long and the call volume is high. The pay sucks and it doesn't seem to be improving anytime soon. Why I'm still here? I love my job, I love making a difference.

Figure 8.46

Forum post example: Work stress and mental distress in a large city

I would suspect that depression runs more frequently in EMS than the general public. The effects of severe sleep deprivation, lack of job security, lack of career advancement, low pay with lots of overtime, missing holidays and weekends, seeing human suffering and death on a regular basis, and stress on non-working relationships all takes its toll.

I've seen many people who are clearly miserable and irritable on the job. One co-worker was given 2 months of leave due to clinical depression from working 5 years at a city station that typically runs all day, and most of the night. He almost got divorced. When he returned to work, he was relocated to a slower rural station.

In Figure 8.47 and 8.48, the forum users describe how emergency service work in close-knit rural contexts can be difficult due to knowing the victim and their family personally, and seeing them after the incidents. This appears to increase the emotional distress experienced by the forum user personally having been in such situations. In Figure 8.49, the forum user discusses their ideas on how the effectiveness of CISD is different depending on circumstances. One potential circumstance is when it is used for emergency services from small towns due to the increased likelihood of knowing the victim's personally. As with Figure 8.47 and 8.48, the forum user in Figure 8.49 appears to suggest that being a paramedic in a rural area can be especially distressing because the paramedics are more likely to know the victims and patients personally, resulting in acute distress. Meanwhile, Figures 8.44 to 8.46 state that working as a paramedic or EMS in highly populated cities is also especially difficult because they face critical incidents more frequently, although they may be less likely to personally know their patients. These forum posts suggest that chronic mental distress such as burnout are a likely outcome of this.

Figure 8.47

Forum post example: Knowing patients personally in a small town 1

2013

Thank you. The joys of small town rural EMS.

We know most of our patients as neighbours and acquaintances.

Even the visitors get to know us after a few years visits.

Towards the end of her fight, we held her hands and told her it was ok to let go and join her husband.

It was hard to do, and it was also the right thing to do.

Figure 8.48

Forum post example: Knowing patients personally in a small town 2

Being from a small town myself where I also volunteer on the squad, I can completely understand 'working a code' longer than normal. We've also it here in special circumstances.

Sometimes in small town EMS, what I find affects me the most is not the code itself, but seeing the family a few days later. Especially if it's a ped or completely unexpected event... that's what gets to me sometimes.

Figure 8.49

Forum post example: CISD in rural areas

2006

I've been to a few CISDs in the last 3 years. They seem to work for some, but not for others, including me. One of the debriefs I attended didn't take place until 3 days after the events, which was a BIG mistake. People had already began dealing with it in their own way and this brought it all back. If you're going to have them, they need to be no later than 24 hours after the incident.

When I stated EMS back in the 70s, CISD was unheard of. We were running 10-11 calls every 8 hour shifts, so we essentially went from one to another with no time to dwell on each one. It seemed to work fine at the time, although I occasionally have a flashback to one particularly bad Ped call (I was diagnosed with PTSD 20 years later) so maybe CISD would've helped, who knows?

I certainly think CISD has a place in low volume community based services since some calls involving friends, neighbours and relatives can be really distressing in small towns.

8.2 Summary of Online Forum Study Results

This section has outlined the results of the online forum study. Using the qualitative approaches described in the methodology chapter (see Chapter 7), I have outlined a number of interesting findings from this study. These findings observe how paramedics experience stress and trauma as a result of the experiences they face in their work. They also observe the different methods paramedics often use to help deal with the effects of stress and trauma. Exercise was quite commonly used and recommended by paramedics. Cognitive advice were also provided, such as managing expectations, and ensuring that there is a separation between one's working life and professional life. My results suggest that the effectiveness of CISD can vary according to the experiences provided by paramedics. This appears to be dependent on whether the individual paramedics are willing to engage with CISD, or if they are pressured into doing so. Many paramedics believed that talking to others is a helpful coping mechanism if an individual is ready to do so. Other paramedics were frequently cited as being the most helpful person to talk to above other types of individuals, due to their capability of understanding and relating to shared or similar experiences. It was also observed that paramedics often display a preference to discuss mental distress in biological terms rather than psychological terms. The finding from this study were used to help develop a second version of the STDRT (see Chapter 6, Section 6.5). Additionally, the online forum study produced findings that could not be incorporated into the STDRT, but could be investigated further in follow-up research, such as the effect of alert tones on physiological heart rates, and the difference in traumatic and stressful experiences between paramedics in rural areas and those in urban areas.

Thus, the results of the online forum study have been outlined. The implications of these findings will be discussed in Chapter 9, Sections 9.1 to 9.2. Additionally, the

way in which these results contributed to the development of the second version of the STDRT are presented in Chapter 6, Section 6.5. The remainder of this chapter will present the results of the feasibility study.

8.3 Feasibility Study Results

The aims of this feasibility study were broadly concerned with feasibility and acceptability to participants of aspects of the study design and research process, with a view to eventual scaling up the study into a robust trial. This feasibility and acceptability would be reflected in matters of willingness of participants to be recruited and randomised, obstacles to recruitment, and the suitability of questionnaires. Specifically, this also involved estimation of sample size for a future scaled up study along with consideration of dropout rates, time needed, and suitability of the 6-month data collection interval.

In this part of the results section, the parameters of feasibility (NIHR, 2019) will be outlined. This will outline the successfulness of the participant recruitment procedure, adherence to measures, and outcome measures required to provide estimated effect size.

8.3.1 *Participants.*

Low participation was observed in this study. Seventeen paramedic students at UCLan signed the consent forms. However, seven participants responded and completed stage 1 of the study, and two of these did not respond to stage 3. This meant that the final sample size was five participants. From the original 17 participants to the final five participants, the dropout rate was 70.59%. The ability to statistically evaluate the effectiveness of the STDRT was limited due to the small sample size.

All responding participants stated that they preferred to complete the study by having the psychometric measures sent to them via email to be completed in their own time, as opposed to doing so in a booked room on the university campus. All participants reported multiple placements through the summer duration; between April 2018 and August 2018. Participants also reported being on placements before the start of this study, largely from late October to early November 2017, and early January to mid-February 2018. Additionally, they reported being on placement after the commencement of stage 3, from mid-November 2018 to mid-December 2018.

Late completion of stage 1 and stage 3 was frequently observed in this study. While stage 1 began on 1st April 2018, all participants did not respond and complete this stage until between late April and mid May 2018. Reminder emails were sent out to help prompt completion of this stage. One participant apologised for their late response, stating that they had been on nightshifts. Another apologised, stating that their university work followed by their placement commencing in mid-April resulted in their delay. Similar delays were observed in stage 3. While this stage began on 16th October 2018, many participants did not complete this until mid to late November 2018. One participant did not complete this until early December 2018, with personal reasons being stated as a cause for delay.

8.3.2 Using the Self-Taught Digital Resilience Training.

During stage 2 of the feasibility study, the experimental participants were given access to the STDRT. Participants did not express any concerns or objections with being randomly allocated into either the experimental or control group. The three experimental participants were able to download this without any reported issues. The Feedback Sheet provided information about the participant's opinions towards the STDRT. Of the three participants, one reported to have viewed the STDRT on a

portable device, one used both a computer and portable device, and one did not specify. Due to concerns about the paramedics' schedules and potential deterrence from participation, engagement with the STDRT was not continuously monitored during stage 2. The content from the Feedback Sheet suggested that the experimental participants engaged with it enough to evaluate its effectiveness, drawbacks, and areas of improvement. Figure 8.50 displays the total scores that the three experimental participants gave for the STDRT in response to the Likert scale questions on the Feedback Sheet. These were largely favourable, with no participants being unsure or disagreeing on any of the points.

Figure 8.51 comprises of the responses that the experimental participants gave for what they thought the most helpful aspects of the STDRT were. Each participant appeared to have different aspects that stood out for them as the best. The first quote focused on the educational aspect, and how their awareness and understanding of different therapies improved after using the STDRT. The second quote was more oriented to how the STDRT helped them personally. The participant claims that the STDRT has helped to reflect and process situations that they have dealt with more deeply, and with more time dedicated to doing so. The third quote focuses on the usability of the STDRT itself, with the many different ways it can help as well as the portability. The third quote also comments on the versatility for different people, which was one of the aims of the STDRT based from the online forum research.

Figure 8.52 comprises of the responses that the experimental participants gave for what they believed the STDRT could have improved upon. One participant did not provide a response for this. The first quote comments on the difficulty of going through it from start to finish, and being able to resume a previous session would help. The second quote comments on the difficulty of using it on a phone.

Figure 8.50

The total number of responses for each question for the STDRT on the feedback sheet by the experimental participants.

	I completely agree	I agree	I am not sure	I disagree	I completely disagree
The program was easy to use	2	1			
The program ran smoothly with no glitches	2	1			
The content in the program was interesting and insightful	3				
The content in the program has the potential to improve my resilience to occupational stress and trauma	1	2			
The tasks in the program were helpful in raising my understanding of occupation trauma, stress and resilience	1	2			
I believe that the program would be beneficial for paramedics at the start of their career	1	2			
I believe that the program would be beneficial for paramedics' years into their careers already	1	2			

Figure 8.51

The written responses on the feedback sheet for the STDRT

I think the best parts of the program are:

“The video snapshots on the different therapies were very insightful. I knew most of them but now I understand them better and will be able to relay my understanding to patients, should they be considering such treatment.”

“The questions make you think more deeply about situations I have encountered, so I take more time to consider just how much an event may have affected me. It gives me a few minutes to reflect on an event and think things through in my head. The programme seems to help me process situations I have dealt with.”

“There are so many different things that can help you on the programme and you can access it whenever you like and it is very versatile for every person as each person has different traumas and deal with them differently.”

Figure 8.52

The written responses on the feedback sheet for the STDRT

I think the program could improve by:

“It is a long programme from start to finish and unlikely to be completed in one sitting. The ability to resume would be useful.”

“On one occasion I tried to access it on my phone and it was harder to use.”

8.3.3 Using the Psychometric Measures.

One aim of the feasibility study was to assess the appropriateness of the chosen psychometric measures. During the study, no queries were made about the CD-RISC-25. One participant raised a query about the DTS and the CIS during stage 1. The participant’s query was related to rating their responses based on how they felt in the last week for the DTS and past two weeks in the CIS. The participant stated that they had not been on placement for seven weeks, so the last traumatic incident they attended

that they wanted to use for the questionnaires was before the timeframe given in these psychometric measures. The participant asked if they should answer the psychometric measures based on their feelings towards the critical incident closer to its occurrence, or in the last two weeks. After discussing this question with my supervisors, I was advised to allow the participant to make reference to a critical incident from over two weeks ago, but base their responses to the measure based on how they felt within the past two weeks. No other questions or issues were raised about the psychometric measures.

All five participants provided feedback for the psychometric questionnaires used. Figure 8.53 shows the total scores given to each point. Generally, the responses were favourable with most responses agreeing with the suitability of the psychometric measures. One participant wrote in the first point for CD-RISC-25 and DTS that “perhaps a longer timeframe because we can go several months without a trauma/ ‘real emergency’”. This participant used their own initiative to write this point, as the responses on the Likert scale by default were expected to be simply ticks in an option box. The participants also appeared to not agree as much on whether being able to identify multiple traumatic incidents in the DTS would have been helpful.

Each psychometric measure was predicted to take 10 minutes to complete, and no participants raised concerns about this taking longer than expected to complete. Based on the distribution of scores observed in the analysis, the CD-RISC-25 and the CIS produced scores considered in the normal range (Beurskens et al., 2000; Connor, 2012; van der Ploeg & Kleber, 2003). In contrast, the DTS produced scores at floor levels (Davidson, 2002).

Figure 8.53

The total number of responses for each question relating to the psychometric measures on the feedback sheet by both the experimental participants and control participants

CD-RISC-25	I completely agree	I agree	I am not sure	I disagree	I completely disagree
The time frame of 'over the last month' was suited to me.	4		1		
The questions were easy to understand.	4	1			
The questions were related to the type of resilience required to be a paramedic.	3	2			
DTS	I completely agree	I agree	I am not sure	I disagree	I completely disagree
The time frame of 'the last week' was suited to me.	4		1		
The questions were easy to understand.	3	2			
The questions were related to the type of mental trauma experienced by paramedics.	3	2			
The identification of one 'most disturbing' trauma was suitable.	3	2			
Being able to identify multiple	2	1	1		1

traumatic incidents
would have been
helpful.

CIS	I completely agree	I agree	I am not sure	I disagree	I completely disagree
The time frame of 'the past two weeks' was suited to me.	4	1			
The questions were easy to understand.	4	1			
The questions were related to the type of fatigue and burnout experienced by paramedics.	3	2			

8.4 Data Analysis

Due to the small sample size for the feasibility study, several assumptions of the MANOVA were violated. Insufficient residual degrees of freedom meant that multivariate tests could not be produced, and a Mauchly's test of sphericity could not be conducted. The data was therefore not normally distributed. Additionally, the Levene's test for equality (Levene, 1960) found a lack of homogeneity across a number of psychometric measure responses (see Table 8.1). While these assumptions of the MANOVA were violated, I decided that for this feasibility study, I would proceed with observing the outcome of this analysis to help prepare for the actions that would be taken should this proceed to a more robust trial. The Greenhouse-Geisser correction was

used due to the lack of sphericity. General patterns from the results were commented and drawn upon, regardless of significant values.

Table 8.1

Levels of Homogeneity

Levene's Test of Equality of Error Variances	F-Value	Significance Value
DTS Intrusion: Start	0.150	0.724
DTS Intrusion: End	11.815	0.041*
DTS Avoidance/Numbing: Start	0.150	0.724
DTS Avoidance/Numbing: End	7.849	0.068
DTS Hyperarousal: Start	7.884	0.067
DTS Hyperarousal: End	3.750	0.148
DTS Frequency: Start	2.693	0.199
DTS Frequency: End	8.278	0.064
DTS Severity: Start	2.437	0.216
DTS Severity: End	0.748	0.451
DTS Total: Start	2.380	0.221
DTS Total: End	0.484	0.537
CD-RISC-25: Start	0.758	0.448
CD-RISC-25: End	3.485	0.159
CIS Total: Start	388.240	0.001*
CIS Total: End	23.204	0.017*
CIS Fatigue: Start	128.738	0.001*

CIS Fatigue: End	1.907	0.260
CIS Concentration: Start	16.157	0.028*
CIS Concentration: End	1.350	0.329
CIS Motivation: Start	123.355	0.002*
CIS Motivation: End	375.000	0.001*
CIS Physical Activity: Start	38.400	0.008*
CIS Physical Activity: End	1.837	0.268

Note. Significant values are marked with an asterisk.

The two-way mixed design MANOVA was then analysed. The mean scores and standard deviations can be observed in Table 8.2. The main effect for the within subject effects was not significant, $F(1, 3) = 0.446$, $p < 0.769$, $\eta^2_p = 0.572$. Therefore, there was not a statistically significant effect of Time. Additionally, there was no significant effect observed for the interaction, $F(1, 3) = 6.291$, $p < 0.283$, $\eta^2_p = 0.950$. Furthermore, univariate tests indicated that there was no effect of Group for any of the 12 dependent variables.

With no significant differences observed, definitive conclusions about the differences in mean scores between the experimental and control group (see Table 8.2) could not be made. General patterns in the differences between the mean scores can however be commented and drawn upon. Graphs of the mean scores were produced to help illustrate the mean scores (see Figures 8.54-8.65).

Table 8.2*Mean scores and standard deviations of the feasibility study*

	Group	Mean	Standard Deviation
DTS Intrusion: Start	Experimental	11.00	5.00
	Control	10.50	3.54
	Total	10.80	3.96
DTS Intrusion: End	Experimental	4.67	4.62
	Control	7.50	10.61
	Total	5.80	6.42
DTS Avoidance/Numbing: Start	Experimental	1.33	2.31
	Control	4.00	2.83
	Total	2.40	2.61
DTS Avoidance/Numbing: End	Experimental	2.33	3.22
	Control	0.000	0.000
	Total	1.40	2.61
DTS Hyperarousal: Start	Experimental	8.00	6.93
	Control	1.50	0.71

	Total	5.40	6.07
DTS Hyperarousal: End	Experimental	3.00	1.00
	Control	1.50	2.12
	Total	2.40	1.52

DTS Frequency: Start	Experimental	6.67	4.04
	Control	8.50	0.71
	Total	7.40	3.05

DTS Frequency: End	Experimental	4.33	4.04
	Control	6.00	8.49
	Total	5.00	5.20

DTS Severity: Start	Experimental	10.33	6.69
	Control	7.50	2.12
	Total	9.20	5.07

DTS Severity: End	Experimental	4.67	5.51
	Control	3.00	4.24
	Total	4.00	4.52

DTS Total: Start	Experimental	17.00	10.54
	Control	16.00	1.41
	Total	16.60	7.50
DTS Total: End	Experimental	9.00	9.54
	Control	9.00	12.73
	Total	9.00	9.27

CIS Fatigue: Start	Experimental	22.33	4.04
	Control	37.50	20.51
	Total	28.40	13.50
CIS Fatigue: End	Experimental	30.00	8.54
	Control	35.50	14.85
	Total	32.20	10.04

CIS Concentration: Start	Experimental	8.00	2.65
	Control	26.00	7.07
	Total	15.20	10.64
CIS Concentration: End	Experimental	10.00	3.00
	Control	30.50	4.95
	Total	18.20	11.69

CIS Motivation: Start	Experimental	7.33	2.08
	Control	13.50	12.02
	Total	9.80	7.05
CIS Motivation: End	Experimental	9.00	1.00
	Control	17.00	12.73
	Total	12.20	7.76

CIS Physical Activity: Start	Experimental	5.00	1.73
	Control	11.00	5.66
	Total	7.40	4.51
CIS Physical Activity: End	Experimental	6.33	2.31
	Control	8.00	1.41
	Total	7.00	2.00

CIS Total: Start	Experimental	42.67	5.77
	Control	87.00	46.67
	Total	60.40	33.92
CIS Total: End	Experimental	55.33	9.02

	Control	90.50	33.23
	Total	69.40	26.23
<hr/>			
CD-RISC-25: Start	Experimental	82.33	10.41
	Control	73.50	14.85
	Total	78.80	11.52
<hr/>			
CD-RISC-25: End	Experimental	86.67	8.39
	Control	74.50	3.54
	Total	81.10	9.09
<hr/>			

Figure 8.54

The DTS Intrusion mean proportion scores for the experimental and control participants within the start and the end of the study

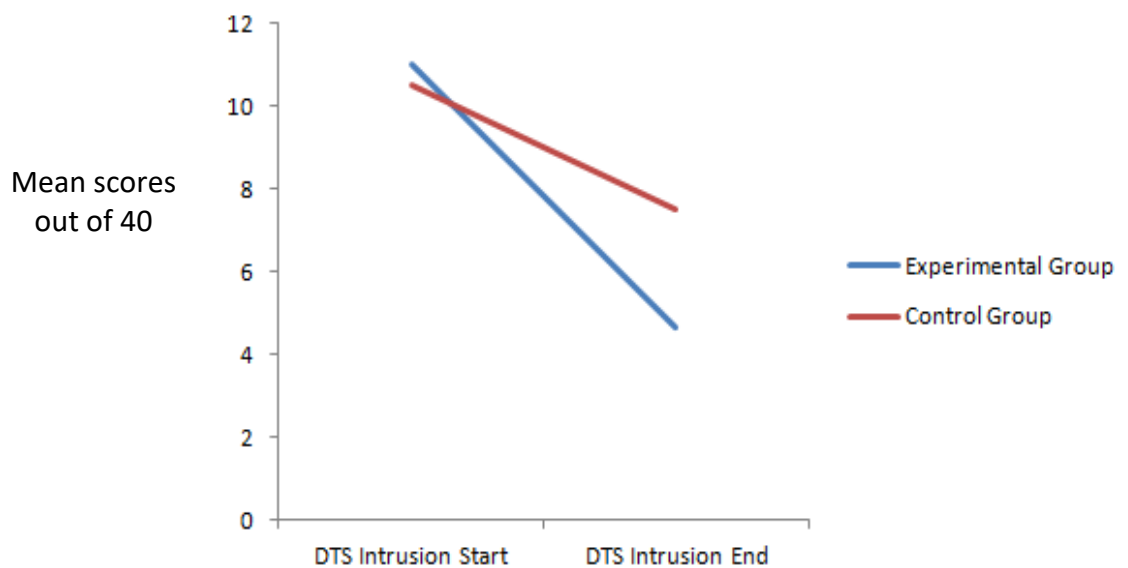


Figure 8.55

The DTS Avoidance/Numbing mean proportion scores for the experimental and control participants within the start and the end of the study

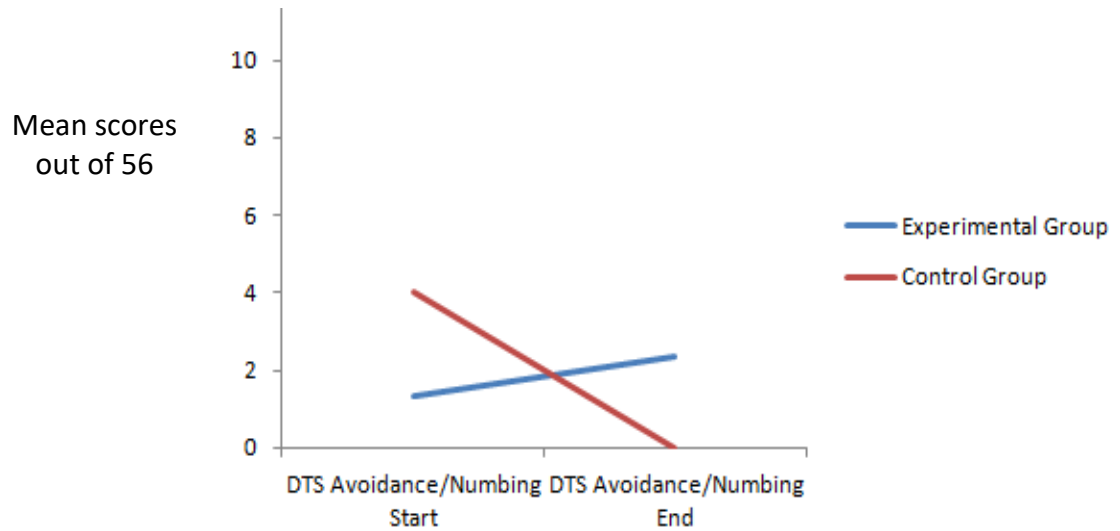


Figure 8.56

The DTS Hyperarousal mean proportion scores for the experimental and control participants within the start and the end of the study

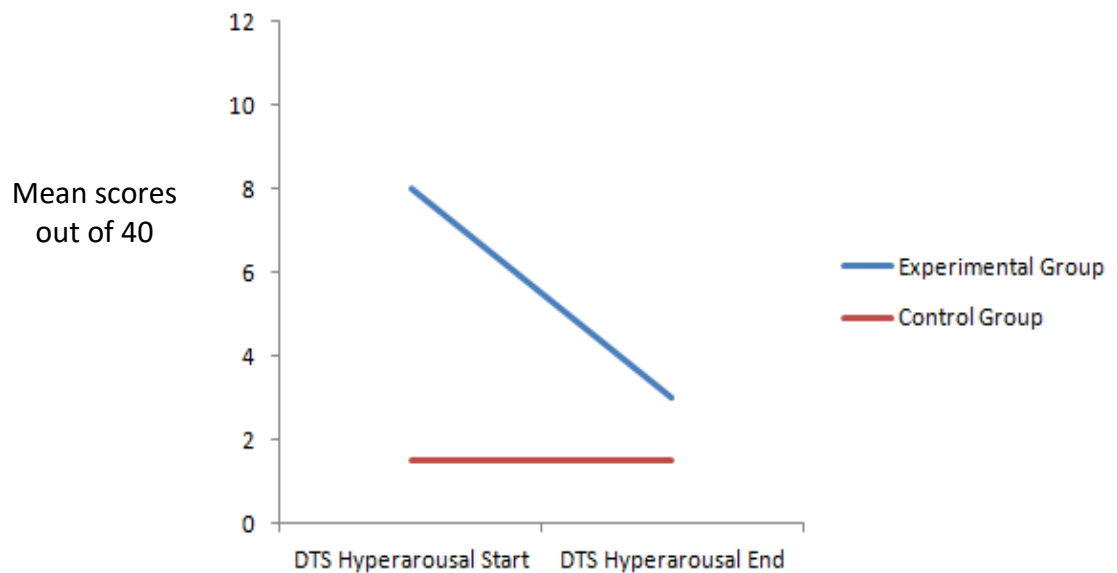


Figure 8.57

The DTS Frequency mean proportion scores for the experimental and control participants within the start and the end of the study

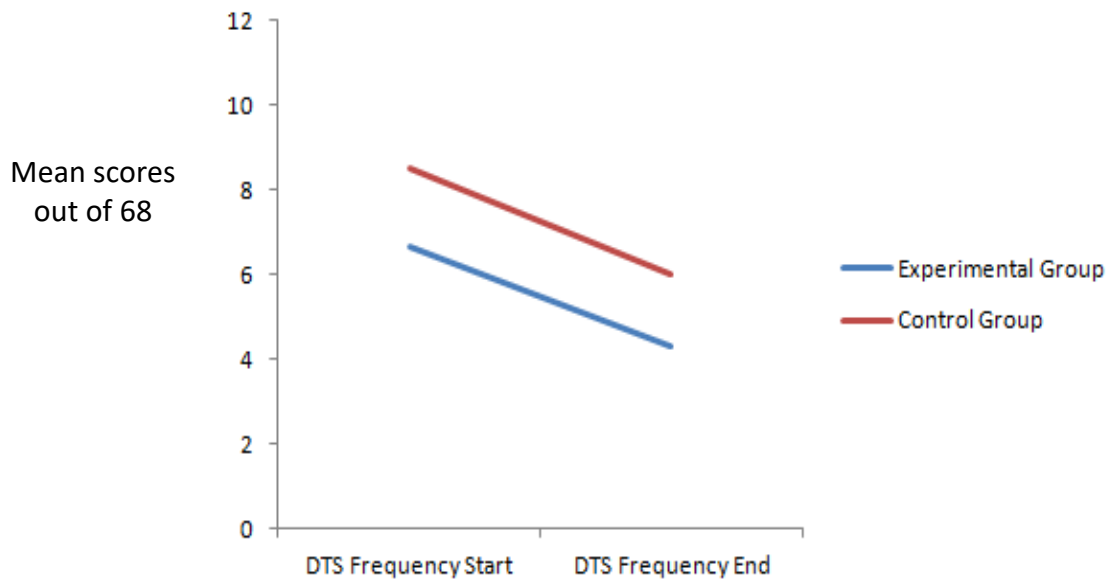


Figure 8.58

The DTS Severity mean proportion scores for the experimental and control participants within the start and the end of the study

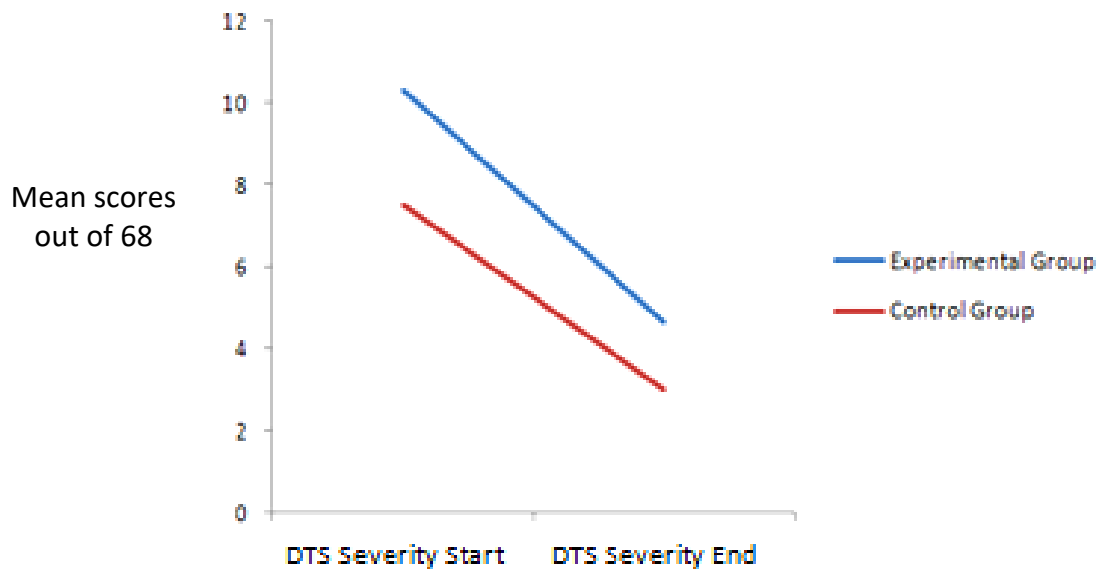


Figure 8.59

The DTS Total mean proportion scores for the experimental and control participants within the start and the end of the study

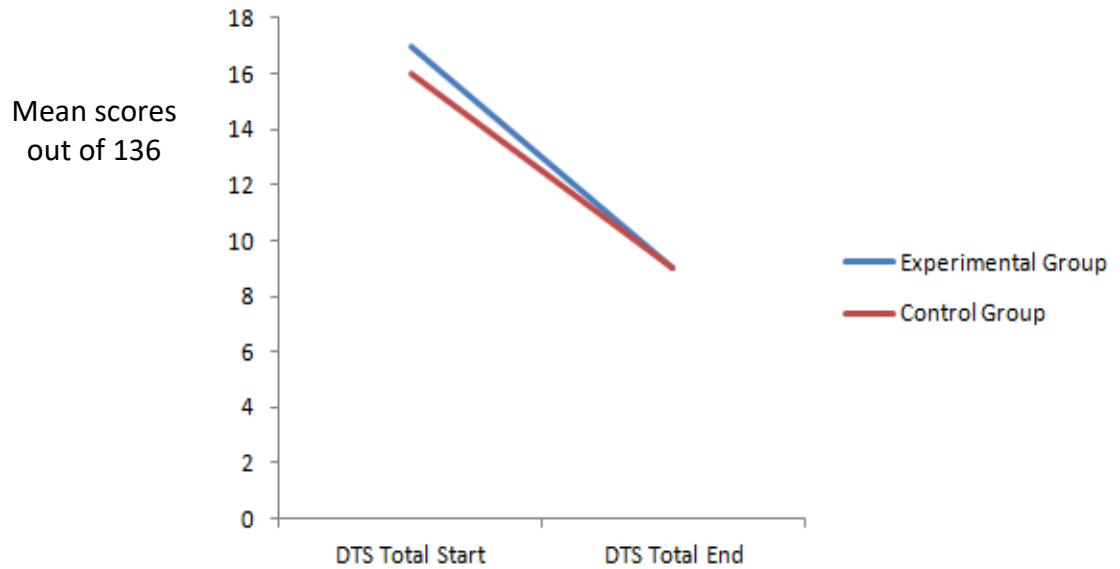


Figure 8.60

The CIS Fatigue mean proportion scores for the experimental and control participants within the start and the end of the study

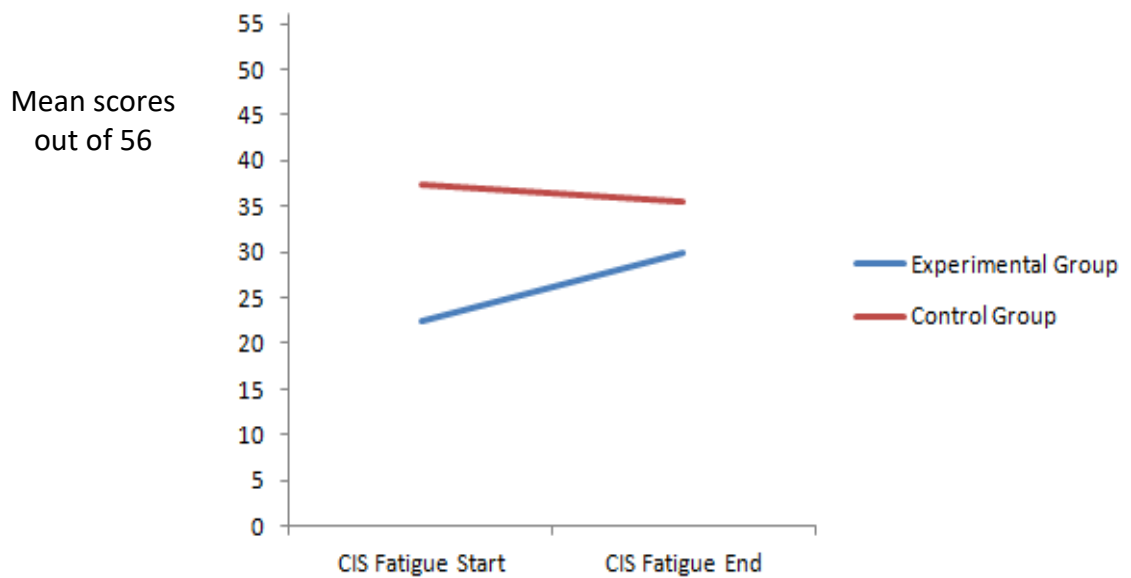


Figure 8.61

The CIS Concentration mean proportion scores for the experimental and control participants within the start and the end of the study

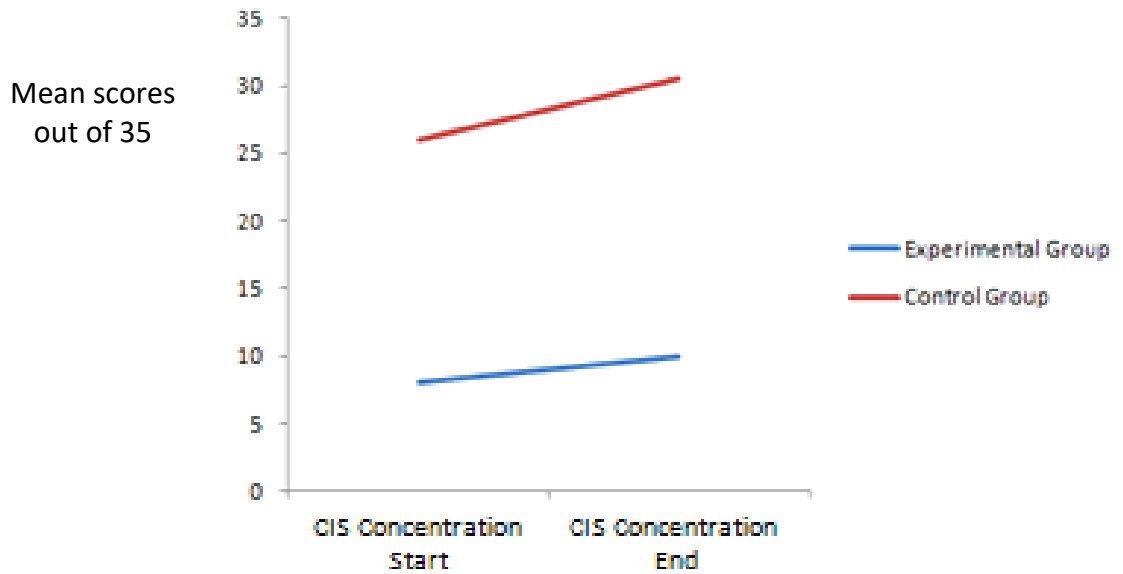


Figure 8.62

The CIS Motivation mean proportion scores for the experimental and control participants within the start and the end of the study

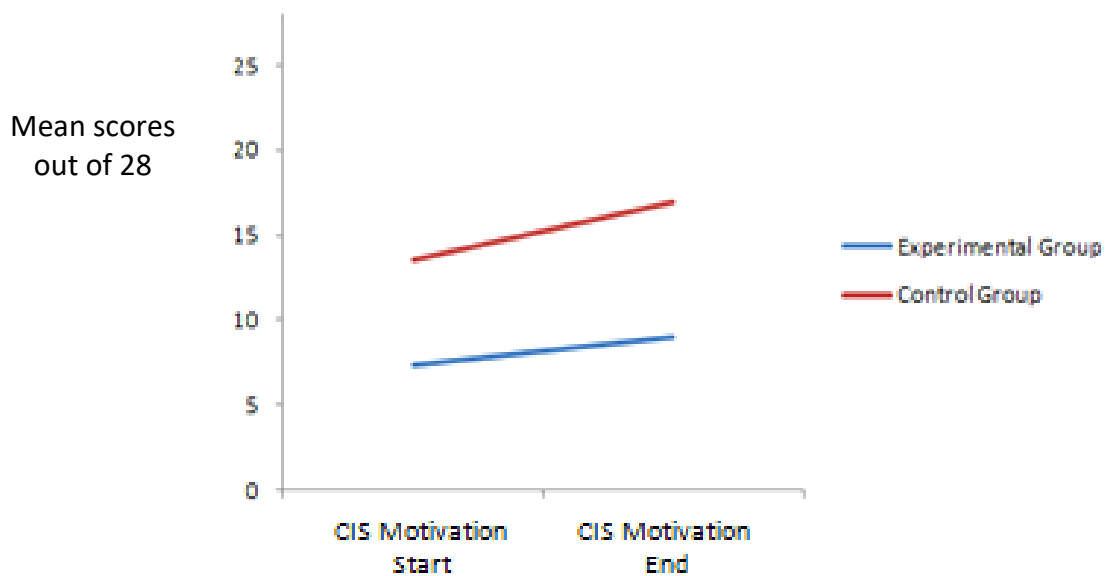


Figure 8.63

The CIS Physical Activity mean proportion scores for the experimental and control participants within the start and the end of the study

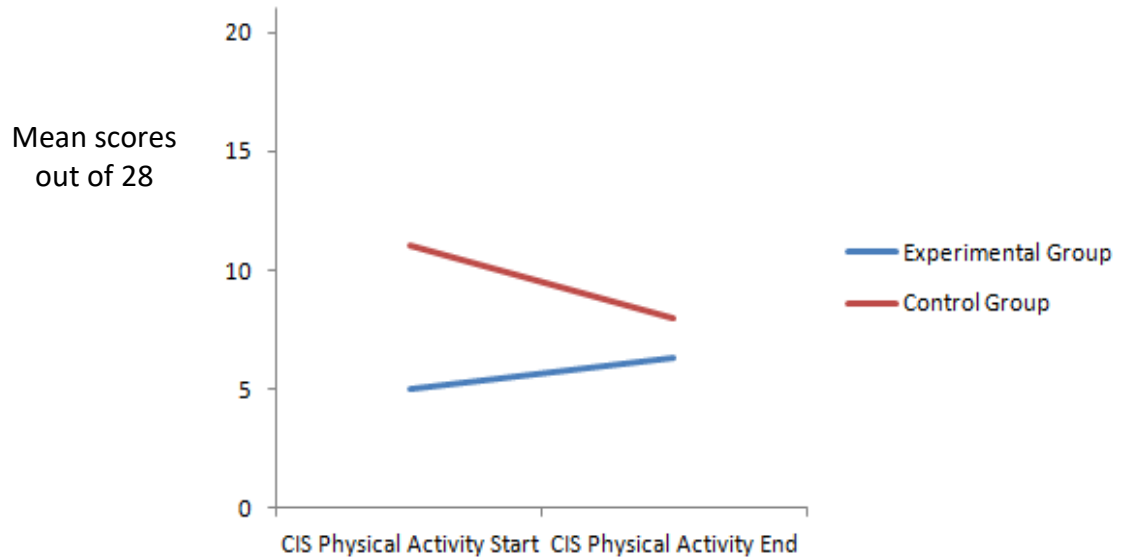


Figure 8.64

The CIS Total mean proportion scores for the experimental and control participants within the start and the end of the study

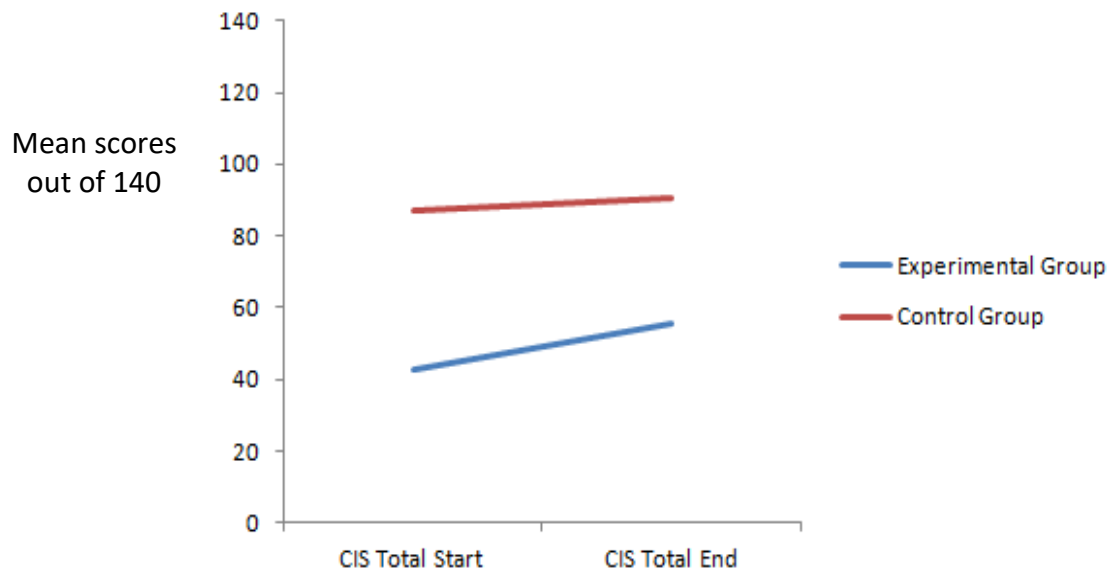
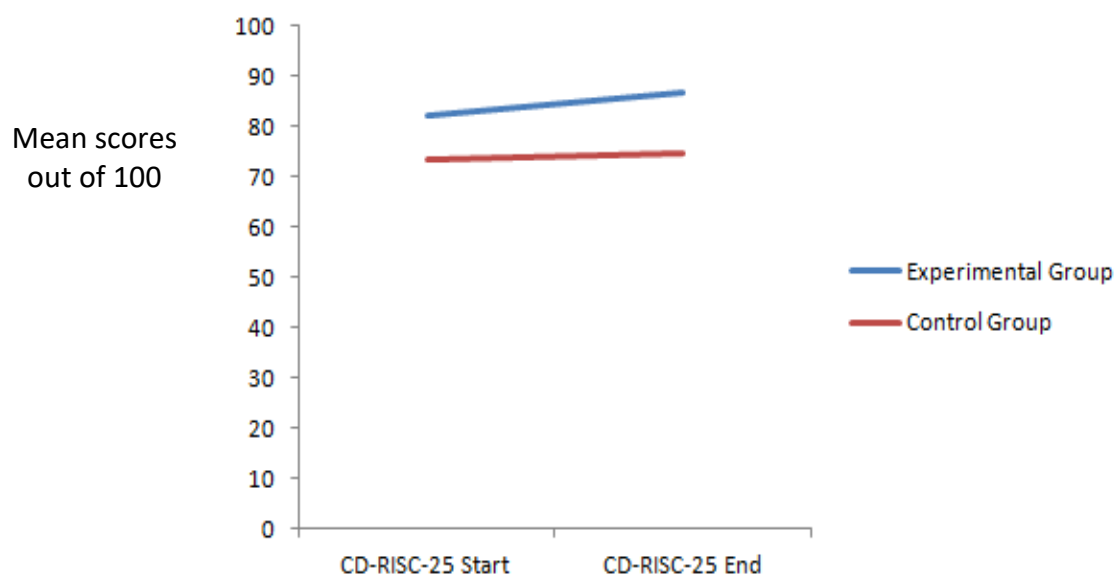


Figure 8.65

CD-RISC-25 mean proportion scores for the experimental and control participants within the start and the end of the study



The scores from the DTS were at floor levels in this study. The y-axis on the respective graphs (see Figures 8.54-8.59) was scaled to view the mean scores, but nevertheless scores were too low to be differentiated. The general pattern was that mean scores mostly decreased between start and end across both the DTS Total and the subscales. The one exception to this was observed for the experimental group in the Avoidance/ Numbing subscale. For this subscale, the experimental group showed an increase in their mean scores after 6 months.

For the CIS psychometric measure, the control group displayed greater mean scores at both start and end. Both the experimental group and control group showed an increase in mean scores for start and end for both the CIS Total and most subscales. The one exception was observed for the control group in the CIS Physical Activity subscale, which showed a decrease in mean scores after 6 months. For the CIS Total, the control group displayed mean scores above 76 both at start and end; indication of high chronic stress. The experimental group displayed mean scores below 76 at both start and end.

The CD-RISC-25 suggested that the participants in this study possessed scores typical of paramedics with no mental health issues (scores above 60, according to previous research). For this psychometric measure, scores increased for both experimental and control groups after 6 months. A greater increase in mean scores was observed for the experimental group compared to the control group.

8.5 Sample Size Calculation

One aim of the feasibility study was to provide an estimate of the sample size used in an anticipated robust RCT. However, the final sample size of five participants for this feasibility study was considered too low to draw any definite figures on the sample size of a robust version of the feasibility study. Furthermore, an uneven number of participants in each group (three in the experimental group, two in the control group) added to the complexity of calculating a sample size for a robust trial based on the results from this feasibility study. Nevertheless, an estimation of sample size for a robust trial was calculated to provide a provisional estimation as opposed to a definitive estimation.

Noordzij et al. (2010) list a number of methods to calculate sample size based on the data from other studies or pilot/ feasibility studies. However, the authors state that many of these are not straightforward, and recommend seeking the help of a statistician unless the more basic formulas are chosen. Noordzij et al. (2010, p. 1390) propose that for a continuous outcome, the simplest formula is:

$$n = \frac{2 [(a + b)^2 \sigma^2]}{(\mu_1 - \mu_2)^2}$$

Where:

- n = the sample size per group.
- μ_1 = population mean in group 1.
- μ_2 = population mean in group 2.
- σ^2 = population variance, or standard deviation.
- a = conventional multiplier for alpha.
- b = conventional multiplier for beta.

This formula was chosen for calculating the provisional estimation of sample size due to its simplicity. This feasibility study however used multiple dependent variables. One of these needed to be chosen to include its population mean and standard deviation into the formula. Since it was hypothesised that the STDRT would directly increase resilience, the CD-RISC-25 scores were used as the outcome measure for this formula. Additionally, it was decided that it would be most appropriate for this study to set the conventional multiplier for alpha at 0.05 to reduce the probability of a type I error, and the conventional multiplier for beta at 0.20 to reduce the probability of a type II error. This gives the formula an alpha multiplier of 1.96 and a beta multiplier of 0.842.

Therefore, the formula for the provisional sample size calculation for a robust trial based on this feasibility study is:

$$n = \frac{2 [(1.96 + 0.842)^2 16.39^2]}{(86.67 - 74.50)^2}$$
$$n = 30.39$$

As the proposed robust trial would be expected to have two conditions (experimental and control) likewise to the feasibility study, the provisional sample size for the robust trial would be 60 participants, with 30 in each condition

according to this calculation. However, in this feasibility study, a dropout rate of 70.59% was observed, in turn meaning that the retention rate was 29.41%. In order to ensure that 60 participants complete the final main trial, a sample size of 205 participants would be needed, as 29.41% of this value equals 60.

It however should be restated that this provisional value of 205 participants is unlikely to be completely accurate. As Noordzij et al. (2010) states, small scale versions of studies such as feasibility and pilot studies tend to be underpowered due to having low sample sizes, and this can lead to unreliable estimates of main trial sample sizes. This issue is especially potent to this feasibility study, which obtained a final sample size of five participants. Thus, rather than focusing on statistical calculations for sample sizes, important lessons from the feasibility study relates to improving participant recruitment strategies.

8.6 Summary of the Feasibility Study Results

The latter sections of this chapter have presented the results of the feasibility study, aiming to assess the feasibility of a main trial to be conducted with the STDRT. This feasibility study observed low participation and high dropout rates. I also obtained approximate timeframes of when the paramedic students were on practical placements throughout their course, and their exposure to critical incidents before the start of this study, if any. From this feasibility study, outcome measures from the three psychometric questionnaires were obtained, as well as participants' opinions on the suitability of the psychometric measures. Following the guidance on feasibility studies for intervention programs by Bowen et al. (2009) who recommended limited-efficacy testing, a statistical comparison was made. Despite the small sample size, a MANOVA was conducted in order to gain an assessment of the general patterns of results. Additionally, a sample size calculation was made using the information from this

feasibility study in order to provide an estimate of the number of participants required in a main trial. The discussion of the implications of these results will be presented in Chapter 9, Section 9.3.

8.7 Summary of the Results Chapter

This chapter has presented the results of the online forum study and the feasibility study. I have presented the results of both these studies in an objective manner. The next chapter will discuss these results, and how they meet or contradict the original aims and objectives that I aimed to investigate. Mirroring the structure of this chapter, the next chapter will provide a discussion of the online forum study, followed by a discussion of the feasibility study.

CHAPTER 9: DISCUSSION

9.1 Introduction

In the previous chapter, the results of both the online forum study and the feasibility study were outlined. This chapter will now provide a discussion of these results to assess their implications and importance. Firstly, the discussion of the online forum study will be provided. This will assess the implication of the findings, and how the online forum study contributed to the development of the STDRT. Secondly, the discussion of the feasibility study will be outlined. This will provide an assessment of how feasible it would be to perform an RCT for the STDRT on a sample of paramedic students. This will also assess the potential implications of preliminary research findings.

9.2 Online Forum Study Discussion

The main findings from the qualitative online forum study have been presented. The originality of this study meant that a lot of novel, interesting findings were acquired. I decided to present the ones that were most relevant to resilience in paramedics and the development of the STDRT. I intend to write up the full list of findings as a separate article for potential publication. Nevertheless, this study remains a key and strong aspect of this thesis. For this chapter, I will discuss only the findings that are relevant to this project, and what is necessary to understand the development of the STDRT. I will now discuss each of the main findings, and the implications for the overall study.

9.2.1 Occupational Trauma in Paramedics and Emergency Services.

From the analysis on the online forums, it is difficult to provide estimates of how prevalent PTSD is in paramedics and emergency services. UNISON (2013)

estimates that while the rates of PTSD in paramedics tend to be around 20%. They hypothesise that these rates may be higher, but is under-reported due to self-report bias and a masculine culture within paramedics. The current qualitative research cannot provide statistics on the rate of PTSD in paramedics. However, the severity of trauma and PTSD within individuals appears to be at time concerning. Those who expressed their symptoms and feelings appeared to be very distressed, and lamented about their lack of support. This is one advantage of qualitative research over quantitative. Rather than mental distress being represented as a numerical score, we can read the user's words that illustrate how they are feeling. Some of the stories further emphasise the need to improve access to mental health care to paramedics and the emergency services.

That is not to say that all paramedics completely opened up about their thoughts and feelings on the online forums. Many paramedics, while methodically describing critical incidents they experienced, did not always provide accounts of how it made them feel. It is understandable that even with the anonymity of being online, not everyone is comfortable with completely opening up about their mental health to others. Additionally, it is possible that users were concerned that describing exact incidents may make them recognisable or traceable to others. This was part of the inherent disadvantage of the study that I as the researcher was not always capable of guiding the discussion to fit the research question. An in-person focus group could have done this.

Overall, many stories identified in the qualitative study about occupational trauma and critical incidents in paramedics were distressing, and the need to provide more support to these workers is very apparent. More research may also help to find better methods to support both paramedics in general and with regards to individual differences. More focused qualitative research may reveal some of the complexities of the distribution of explanatory ideas and conceptual affinities across diverse groups of

paramedics, and explore the implications for the experiences of trauma and how it is coped with.

An important observation was the importance of the paramedic's story in conveying their problems and feelings to others on the forum. Most paramedics on the forums expressed their distress by providing a detailed story of their critical incident, rather than outlining their symptoms or directly expressing their feelings. There are several potential explanations for this observation. One explanation is due to the paramedic work culture itself. The paramedics in the forums trusted other paramedics to understand how they felt based more on the stories alone, since they undergo similar experiences. Both this online forum study and available research (Mildenhall, 2012a; Mildenhall, 2012b) suggests that paramedics prefer to discuss mental distress with other paramedics as they believe they will understand their issues better, and these observations appear to be related. Additionally, some reports suggest that the paramedic work culture can often attach stigmatisation to mental distress (Quaile, 2016). Seeking help on forums by discussing the critical incident itself rather than the symptoms and feelings of the paramedic may help with avoiding stigmatisation by 'hiding their feelings and symptoms' behind the critical incident.

Another explanation for this observation may be related to the importance of the paramedic's own story. Given that paramedics often discussed their critical incidents more so than their symptomology or how they felt, as well as the details in which they went into, may suggest that these stories are important to how the paramedics deal with their mental distress. The formation and duration of the mental distress that paramedics endure may be closely related to how the paramedics conceptualise the critical incidents that resulted in this. For the STDRT, as well as future research, this may suggest that more emphasis should be placed on the paramedics' stories, rather than simply labelling

it as a ‘critical incident’ and managing the symptoms of mental distress and PTSD only. This idea of a greater emphasis on the paramedics’ stories was difficult to incorporate into the STDRT. This is because the STDRT aimed to incorporate ideas of resilience to help prevent mental distress, rather than helping to alleviate it after the onset. Nevertheless, this may be explored more in future research, and may be evaluated in the context of TIA (see Chapter 10, Section 10.5.1).

9.2.2 Debriefing and CISD.

The effectiveness of CISD is still subject to research, as the current literature suggests mixed effects. The meta-analysis by Pia et al. (2011) highlights previous studies that provide evidence both for CISD being effective and for CISD exacerbating PTSD symptoms. Some research suggests that trauma debriefing such as CISD actually worsens PTSD (Bledsoe, 2003; Rose, Bisson & Wessely, 2002).

From the qualitative analysis on forum member’s experiences, it seems that we can understand more about *why* CISD has mixed results across research. It seems that CISD is more successful when the occupational trauma victims are happy to engage with it. When they prefer not to discuss their experience, but are made to do so anyway, then that appears to be when CISD is most likely to result in exacerbation of symptoms. This suggests that CISD should be optional rather than compulsory. More research is needed to further explore this potential interaction. Moreover, further research is needed to explore other potential interactions in CISD. Campfield & Mills (2001) suggest that CISD is effective when administered within 10 hours, but becomes significantly less effective when delayed for 48 hours. This suggests that the time delay of CISD administration is an important interacting factor that may in part explain the mixed results when evaluates. Otherwise, there does not appear to be any other previous research that explores alternate variable interactions with CISD. Almost all previous

research aimed to simply measure if CISD directly results in symptom improvements or not. Research could further explore variable interactions in CISD, such as individual differences, or whether CISD was compulsory or optional for an individual.

9.2.3 Biological and Psychological Language.

The online forum study found that paramedics possessed a tendency to explain psychological illness using biological terminology and analogy. This finding has a rational explanation. As paramedics treat physiological injuries in their patients for a living, they are more familiar with the biological than the psychological. Therefore, this may explain the finding that paramedics prefer to explain psychological damage using biological terminology. While the biology-focused nature of their profession explains this, this effect could also be coinciding with the masculine-oriented culture within paramedics. The masculine-based culture in paramedics is likely to be causing an under-reporting of mental distress within this profession (Alexander & Klein, 2001; UNISON, 2013). This same effect could also explain the paramedics' preference to explain mental illness using biological terms. Doing so may help to reduce the stigma associated with mental illness, as it removes the implication that it is a character flaw, or 'sign of weakness' (Phelan, 2002). The preponderance of North American forum members may also have contributed to this privileging of the physiological; where arguable a biological emphasis may more obviously be part of the medico-psychiatric culture (Lewis-Fernández & Kleinman, 1994). That said, many of the forum members were also conversant in the language of 'talk' as therapy and support.

This finding therefore had implications for the development of the STDRT. If paramedics are more familiar with biological terminology, and prefer this approach, then the STDRT could use such language and terminology to be better suited to the paramedics that use it. As well as including biological explanations of occupational

trauma and PTSD, the program could aim to use more biological language throughout in order to ‘speak their language’. The feasibility study can therefore examine whether using more biological terminology in the STDRT is more effective or not.

It should be noted that paramedics in the online forum study still used psychological terminology as well. For instance, in Figure 8.7, the participant talks about ‘re-hashing the anxiety’ with regards to their views on CISD. While biological terminology to explain mental distress appears to be used frequently among paramedics, this does not mean that an understanding of neural biochemistry is the opposite of appreciating psycho-therapeutic explanations or support.

9.2.4 Approaching and Treating PTSD in Paramedics.

The online forum study found that exercise was amongst the most popular coping mechanisms for occupational stress in paramedics. The effect of exercise in helping to alleviate stress is well-documented (Barton & Pretty, 2010; Head, Singh & Bugg, 2012; Taylor, Sallis & Needle, 1985). However, exercise may be particularly important to this population group. As paramedics treat physical damage in others, they would be theoretically more likely to prioritise physical health within themselves (Rice, Glass, Ogle & Parsian, 2014).

My research suggests that the paramedics who do engage with exercise found it particularly helpful. However, the literature suggests that the emotionally draining nature of their profession means that many paramedics often lack the motivation or sufficient time to do exercise (Beaton & Murphy, 1993; Tsismenakis et al., 2012). Therefore, the STDRT could include a section on explaining the benefits of exercise and providing instructions on how to engage in this.

Furthermore, the study found a number of links between cognitive thinking patterns and symptoms of work stress. For instance, it appears that burnout can be caused partially by a gap between one's expectations at the start of their career and an actual less satisfying reality months or years later (Friedman, 2000). No related information on this was found during my narrative literature review. Hence, I initially thought that this was a novel finding within my forum research. However, my narrative literature review was more centred on acute trauma and PTSD, rather than chronic stress and burnout. A refined search using the term 'burnout' found that *realistic expectations* and burnout was fairly well researched already. This effect has been suggested in both mental health professionals (Lamb, 2009), nurses (Browning et al., 2006), and hospice staff (Swetz et al., 2009). Porter and Johnson's (2008) pilot study for resilience in paramedic students included a psychoeducation topic on realistic expectations among other topics. They found improvements in their treatment group (albeit this was non-significant). Therefore, both my forum research and prior research suggests that possessing realistic expectation may constitute a resiliency factor for chronic stress and burnout. This therefore was an area that the STDRT could focus on.

Additionally, the online forum study suggested that the separation of a paramedic's personal life from their work line was often identified as a helpful coping mechanism to avoid work stress. A number of forum users believed that having hobbies and personal relationships separate from their work, as opposed to their work 'becoming their life' was an important factor in providing resilience to work stress. Indeed, an imbalance between work and personal life has been cited in research as a source of stress among paramedics (Nirel et al., 2008). It therefore seems that a part of resiliency to work stress involves not letting one's work life corrode their personal life. Thus, work stress and chronic trauma appears to occur when the stress is greater than one's external factors of resilience (Reches & Sondaité, 2014). The STDRT can focus on

managing to increase external resilience, and decrease work stress entering one's personal life.

9.2.5 *Talking and Seeking Help.*

As well as exercise, talking was also a frequent coping mechanism in paramedics. A part of resiliency is not only being able to process stressful stimuli yourself, but to not be ashamed or reluctant to ask others for help when you need it (Himelein & McElrath, 1996). This essentially is a combination of internal resilience, in being confident to talk to others, and external resilience, in having a support system that can provide help when needed. The study further found that within the qualitative data for talking to other for help, talking to co-workers was most frequently used and recommended. This supports previous research, which also finds that talking to co-workers is a common coping mechanism in paramedics (Mildenhall, 2012b).

The online forums possess the advantage of anonymity, and potentially having a wider range of options as to who to talk to. One can easily talk to paramedic from other areas and stations. Furthermore, paramedics also encouraged distressed users to seek professional help if they felt this was appropriate. Some of the more experienced paramedics sometimes realised that a given user was in a quite serious condition, and recommended this. Thus, while a masculine work culture of paramedics may often deter them from this option (Clompus & Albarran, 2015), it is important that they are not ashamed to seek professional help if they need this.

9.2.6 *Alert Tones.*

The online forum study reported a number of paramedics who claimed that, due to alert tones at work, they experience physiological heart rate increases when hearing loud tones outside of work. This could be due to the paramedics being classically

conditioned to associate loud alarms with their stressful work (Rabinak, Mori, Lyons, Milad & Phan, 2017). On the other hand, it could be that the alarms trigger PTSD symptoms such as hyperarousal (Jones & Barlow, 1990). While this automatic reaction is unlikely to be treated with cognitive resilience, it is an interesting area that future research can consider. For instance, alarm tones could be changed to be less shrilling, or have different levels depending on the severity of the call (e.g. code blue, code red etc.). While some research has looked into elevated heart rates due to alarms in paramedics (Goldstein, Jamner & Shapiro, 1992; Kuorinka & Korhonen, 1981), these have mostly been physiological studies, and have not framed this within PTSD, nor aimed to find a potential solution to this issue. Thus, more research is needed.

9.2.7 Empathy.

The role of empathy in resilience to mental distress from secondary trauma is unclear and mixed according to the research literature. Mixed reports suggest that this may be helpful (Grevin, 1996) or unhelpful (Regehr, Goldberg & Hughes, 2002). The online forum study also found this mixed reporting. Some paramedics advocated that avoidance was the best policy, while others argue that processing critical incidents in a suitable manner was most beneficial. It could therefore be concluded that some paramedics possess a natural form of resilience that allows them to utilise avoidance to prevent the onset of mental distress such as PTSD in their work. Meanwhile other paramedics suffer from their empathetic connections to patients, and must therefore develop additional coping strategies to help deal with this.

However, the possibility of other factors should be taken into consideration. It may be possible that the paramedics who claim that avoidance helps were at the time of posting experiencing the short-term benefits of this approach. Some research suggests that the use of avoidance may result in greater PTSD in the long term (Mildenhall,

2012a; Ogińska-Bulik & Kobylarczyk, 2015). Therefore, it is possible that these paramedics recommended avoidance as a strategy before the negative long-term consequences began to take effect. Instead, it may be that paramedics perform best when they are able to elicit a balance between empathy and avoidance. It seems from this research that too much empathy results in greater secondary traumatic stress, while too much avoidance results in an inability to process critical incidents in a healthy manner. Further research is required to explore these potential resilience components in paramedics. This may relate to the voiced antipathies to CISD. For instance, debriefing may for instance be more effective when empathy and distress is allowed to be expressed as a natural and human response, but less effective when viewed as symptoms of mental illness that needs to be treated. Once more, further research is required to explore these possible dynamic.

9.2.8 *Issues and Limitations.*

A potential criticism of this study was the lack of reliability checks. Whether inter-rater reliability in qualitative research is needed and attainable or not is a contested subject among researchers. Morse (1997) argues that inter-rater reliability is not attainable in unstructured interactive qualitative data. With the purpose of unstructured interactive qualitative research being to allow the researcher to learn more about a novel topic in a fluid nature, it is not suitable to use a new coder to assess a highly interpretive process. Morse argues that instead of aiming to attain inter-reliability through a second coder, qualitative inquiry studies should instead focus on checking for components more closely related to social sciences, such as rigour and credibility, using non-quantitative methods, such as prolonged engagement and peer debriefing. Researchers such as Morse who challenge the notion of consistency in analysing qualitative data are said to hold a post-positivist or, in the extreme, post-modernist view (Armstrong et al., 1997).

However, researchers with positivist and modernist views believe that not only is inter-rater reliability in qualitative studies possible, but it is also necessary for the results to possess validity (Roberts, Dowell & Nie, 2019). Additionally, a second coder would help to reduce the likelihood of the study being affected by researcher bias (Pope, Ziebland & Mays, 2000), human subjectivity (Lacy, Watson & Lovejoy, 2015) and random error (Hruschka et al., 2004). According to the modernist view, the original research needs to demonstrate a clear procedure or algorithm of how the qualitative analysis was conducted, and a second coder needs to be able to display an inter-reliability agreement of at least 75% (Chaturvedi & Shweta, 2015; Roberts, Dowell & Nie, 2019).

The current research conducted a peer debriefing with the supervisory team in order to proclaim a reasonable level of rigour. Additionally, the extent of the qualitative analysis conducted in this study demonstrates that prolonged engagement was performed. Hence, this demonstrated rigour, and I succeeded in learning more about a novel topic through immersion in the data. However, from a modernist view, the absence of a second coder means that the online forum study cannot strictly claim to be reliable. It is unknown whether this study would produce the same results if conducted again using the same procedure. Without a thorough inter-rater reliability check, the online forum study may possibly have been susceptible to researcher bias (Pope, Ziebland & Mays, 2000), human subjectivity (Lacy, Watson & Lovejoy, 2015) and random error (Hruschka et al., 2004). If a study cannot claim to be reliable, then it cannot also claim to be valid (Roberts, Dowell & Nie, 2019). From the modernist perspective, this would put into question as to whether the obtained resilience factors for paramedics are true constructs.

While hypothesis testing is not required in feasibility studies, it may be important for the feasibility study in this project to obtain a preliminary measure of how the STDRT affects responses on the psychometric measures (see Chapter 9). If the STDRT based on the resiliency factors identified in the online forum study are suggested to have a protective effect against PTSD, then it may assist with redeeming the validity of the online forum study from a modernist perspective.

9.2.9 Influence on the Self-Taught Digital Resilience Training.

The findings of the online forum study provided further ideas and insight for the contents that could be included into the STDRT. The online forum study provided insight for both psychological resilience factors for paramedics and ideas for tasks that aimed to increase this. For instance, the mixed opinions paramedics had on the effectiveness of CISD, which additionally pertains to the literature (Pia et al., 2011; Rose, Bisson, Churchill & Wessely, 2002), suggested that the STDRT should neither recommend that paramedics talk about a traumatic incident as soon as possible, nor never talk about it to anyone else. The STDRT should therefore aim to make the user aware of the conflicting evidence of CISD and avoid proposing any definitive conclusions about its effectiveness, but recommend the user to make their own judgement about whether they would prefer to speak to someone about their traumatic experiences or not.

Additionally, the online forum study highlighted the role of expectations early in a paramedic's career and burnout later in their career. While this has been demonstrated in prior research focused on burnout (Browning et al., 2006; Friedman, 2000; Lamb, 2009; Swetz et al., 2009), it was not noted in my original narrative literature review (see Chapter 5) that was focused on PTSD. The online forum study therefore highlighted the influence of this, and provided insight into the role of expectations and burnout in

paramedics. The STDRT could therefore develop a form of cognitive task designed to help attain healthy levels of job expectations in paramedics in order to theoretically prevent the increased likelihood of burnout.

The preference for paramedics to use biological terminology instead of psychological terminology is an interesting finding. This is furthermore something that can be applied to the STDRT. Throughout the STDRT, the terminology used to describe key terms may therefore be changed to be based on biology rather than psychology in order to make paramedics relate to it more and ‘speak their language.’ For instance, symptoms of flashbacks may be described as a ‘dysregulation of working memory caused by medial frontal hypoactivation and amygdala hyperactivation’ rather than ‘re-experiencing of distressing memories caused by traumatic events.’ Additionally, the STDRT could expand on this by creating sections explaining how traumatic events result in PTSD from a biological perspective, and recommended treatment and support options could be expanded to include more biological options such as medication. That said, a mixture of biological and psychological concepts is not precluded by the literature or the forum research, and a more general commitment to plain language in presentation of complex ideas may be most appropriate.

The manner in which paramedics approach help for psychological issues as observed in the online forum study can also influence aspects of the STDRT. The fact that many paramedic’s appeared to be concerned or reluctant to discuss mental health issues with others itself provides support for the creation of tools such as the STDRT that provide help and information about this issue without contact with another individual. Additionally, the STDRT could further incorporate aspects that facilitate paramedics’ apparent preference to discuss their mental health issues with others in-person as a last resort. The STDRT could cite the online forums themselves as a method

of talking and listening to others about these issues anonymously to protect their identity and privacy. This may help paramedics, especially as some may not be aware this option is available. Also, online forums can be accessed any time so would not conflict with working hours. Furthermore, the qualitative analysis in the online forum study cited the forum use as a frequently preferred method of seeking help. Additionally, the STDRT could incorporate aspects that consider the often hyper-masculine attitude towards mental illness as observed in the STDRT. For instance, more references to cases of PTSD in the military could be made to demonstrate that PTSD has the potential to affect anyone despite apparent ‘toughness’ (Reit, 2017).

There were several findings of the online forum study that were interesting as separate pieces, but were not capable of being incorporated into the STDRT. The long-term effect of alert tones on the heart rates of paramedics was a novel and important finding. However, while future research may investigate this more, the STDRT was not capable of assisting with this largely environmentally caused issue. Also, the online forum study concurred with the research literature with the mixed findings on the role of empathy (Grevin, 1996; Regehr, Goldberg & Hughes, 2002). The online forum study provided mixed evidence as to whether emotional attachment results in greater susceptibility to PTSD or not, and whether avoidance results in greater susceptibility to PTSD or not. Therefore, this mixed evidence meant that the STDRT was not able to provide information or tasks relating to empathy.

9.2.10 Cultural Aspects of the Online Forum Study and Influence on the Self-Taught Digital Resilience Training.

One proclaimed advantage of online forum studies is their ability to recruit participants from different countries (Vicsek, 2016; Woodyatt et al., 2016). In theory, it could therefore be possible that the STDRT may be influenced by different cultures.

The demographic data from the online forum study suggests that the majority of participants were from the US, while a minority of other participants were from Canada, the UK, Republic of Ireland, Germany, Australia, New Zealand, Mexico and Ecuador. Classifying nations into cultural groups is not a simplistic task (Vignoles et al., 2016), but cultural models can be used to obtain a general idea. According to Huntington's (1996) cultural model, the US, Canada, the UK, Republic of Ireland, Germany, Australia and New Zealand would all be classified as Western cultures, while Mexico and Ecuador would be classified as Latin American cultures. It therefore appears that the STDRT was predominantly influenced by Western cultural ideas.

There are several implications which flow from this. The identified resilience factors of PTSD may be exclusive to Western cultures, and not applicable to other cultures. Research suggests that the diagnostic criteria for PTSD may differ across cultures (Michalopoulos et al., 2015). If the Western diagnostic criteria do not map well onto other cultures, then the Western treatment or resilience approaches may not do so either (Michalopoulos et al., 2015). Additionally, Theron and Liebenberg (2014) hypothesise that resilience and social-ecological systems possess a complex interaction. This may result in changes to the underlying resilience factors across different cultures. Future research may therefore consider the potential effects of applying the STDRT within non-Western cultures. This is especially as the frequent use of biological terminology to explain mental distress by the paramedics may have resulted in the STDRT being more oriented towards Western medical models of psychiatry.

As well as the potential differences in cultures across different nations, the differences in cultures within nations must also be considered. While the majority of participants were from the US, there appears to be a divide within this between the participants from urban environments and those from rural environments. Studies have

suggested that there are certain differences between these two with regards to risk and protective factors of PTSD (Erickson et al., 2013). With regards to paramedics across urban and rural environments, this may have some influence on the development of the STDRT. It was observed in the online forum study that paramedics from urban environments tend to be exposed to critical events more frequently and may be more at risk for chronic forms of mental distress such as burnout. Paramedics from rural or small-town environments on the other hand tend to be exposed to more difficult critical events due to the greater likelihood of personally knowing the victims and may be more at risk of acute forms of mental distress such as PTSD. The STDRT may therefore have acquired both resilience factors for chronic forms of mental distress due to the input from paramedics working in cities, and resilience factors for acute forms of mental distress due to the input from paramedics working in rural areas.

9.3 Summary of Online Forum Study Discussion

While the online forum study was useful in the development of the STDRT, it was also a key aspect of this thesis due to its originality and for providing further insight into the stressors that paramedics face, their forms of resilience and coping mechanisms. Despite limitations and disadvantages of the chosen design, the online forum study constitutes one of the important, original and key aspects of this project. A report for the full findings and implications for this study can be written as an independent article for potential publication following this thesis.

Prior to my project, my approach towards research was very much reductionist. I held the view that aiming to develop fewer explanations for as much of an observed phenomenon as possible is the best way to ascertain scientific validity. From a psychological viewpoint, I initially aimed to develop more universal rules applicable to people. However, during the course of my qualitative research on the online forums, I

became more aware of how individual paramedics respond differently to various circumstances. An example of this is how paramedics in the online forum study gave mixed views on whether being debriefed after a critical incident was helpful or not. I additionally became more aware of how resilience in paramedics was more specific to them as a workforce, and different from the general population. Throughout this project, my views became less reductionist, and moved towards a more holistic and humanistic approach of mental distress and PTSD in individuals (Joseph, 2019; Vachon, Bessette, & Goyette, 2016).

Thus, I have provided a discussion for the results of the online forum study. The way in which these results contributed to developing the second version of the STDRT is presented in Chapter 6, Section 6.5. The next section will provide a discussion of the results of the feasibility study.

9.4 Feasibility Study Discussion

The feasibility study has demonstrated that the STDRT has the potential to be further tested in a larger RCT. While participation was low, the participants who completed this study responded well to the STDRT and to the study procedures. Lessons have been learned for improving participant recruitment and the selection of psychometric measures.

9.4.1 Using the Self-Taught Digital Resilience Training.

For this feasibility study, it was important to observe how the paramedic students in the experimental group felt about the STDRT. It was important to determine if they found this easy enough to use, and if they felt it was helpful with building resilience specific to their role as a paramedic. The feedback sheets provided particularly encouraging aspects of the feasibility study. Despite only the three

experimental participants being able to provide feedback on the STDRT, there was a decent balance with the devices in which they viewed this on. One viewed the STDRT on a computer, one on a portable device, and one used both. The responses to the seven questions on the Likert scale demonstrated that the STDRT possessed the potential to perform its intended purpose. As observed in Figure 9.13, all the experimental participants either agreed or strongly agreed to the questions related to the effectiveness of the STDRT. All participants reported the highest possible score for their opinion of the interestingness and insightfulness of the STDRT. As the STDRT was created using primary source information from the online forum study, it was especially encouraging to find that the paramedics in this feasibility study reported that the program was accommodating to them. Additionally, the written feedback provided was insightful. The provided testimonies further highlighted the potential the program has to help improve resilience in paramedics. The testimonies were related to both the efficacy of the program and how it helped with the paramedic student's own experiences. The testimonies related to the improvement of the STDRT highlights how its potential could increase if it was used on a more powerful program than PowerPoint. This would allow the program to be able to save and resume progress, make the tasks more interactive and make it easier to use on portable devices.

The feedback for the STDRT did contain potential methodological issues. As well as general issues with a small sample size, it is likely that the paramedic students who chose to participate did so because they were already more likely to engage with the STDRT due to a preconceived interest in mental health and technology. A telling aspect was that one respondent in the written feedback stated that they knew about most of the therapies from the STDRT beforehand. This would therefore mean that the study was liable to participant recruitment bias (Martinson et al., 2010). Any future extension of this feasibility study may need to take actions to help motivate a more diverse sample

to agree to participate in order to obtain the views of those who may not already have a prior familiarity with this subject area.

Additionally, while the experimental participants were trusted to engage with the STDRT over a 6-month period, no direct information was obtained on how often or profoundly they used it. The detail of information provided in the written feedback excludes the possibility that they did not really engage with it at all. Yet a future study based of this feasibility study would benefit from collecting this information for analytical purposes as well as to ensure that the participants really do engage with the STDRT. Furthermore, I had no definitive way of knowing if the participants continued to use the STDRT after the feasibility study ended, or if they kept using it. The control participants were given access to the STDRT after the feasibility study ended; it would be interesting to know if they began to engage with the STDRT after the end of the study. Should a main RCT be conducted at a later date, follow-up data collection could be used to assess if the participants felt that the STDRT was helpful enough to continue using after the end of the study to help with their careers.

9.4.2 Participation.

Few studies have been conducted on paramedic students, and no other studies have asked them to engage in a self-taught resilience training tool for a long duration. An important aim of this feasibility study was therefore to assess if paramedic students were willing to participate in this study, and how best to recruit and retain them.

This feasibility study aimed to recruit paramedic students from a class cohort of around 40 students. While 17 signed the consent forms, only seven completed stage 1, and five completed stage 3. Provisional calculations suggest that the dropout rate for this study was 70.59%, and that the predicted sample size for the main trial should be 205 participants. However, given the low sample size of the participants in this

feasibility study, the subsequent calculations used to help estimate parameters cannot be relied upon (Noordzij et al., 2010; VanVoorhis & Morgan, 2007). Instead, with respect to participation, the outcome of this feasibility study should focus on reflecting upon participant recruitment strategy and tactics, and how this could be improved for a main trial.

Firstly, the study may benefit from more institutional support. While as a PhD student I did my utmost to recruit participants in an effective and ethical manner. Nevertheless, I personally felt that the paramedic students would have been more encouraged to participate if the study was better supported institutionally and allied to relevant official partners. While permission to contact and present my research to the students was granted by the paramedics' staff at UCLan who were also helpful and generous in encouraging participation, the study would most likely have benefited from presenting itself as being more than a PhD study, but possibly an official program within an organisation such as NWAS. Possessing stronger infrastructural ties is a factor of more successful participatory recruitment that previous studies have highlighted. Newington and Metcalfe (2014) suggested that infrastructure and professional connections are important aspects for recruiting participants in health-related studies. As well as opening more access opportunities for participants, this makes individuals more willing to participate due to a greater sense of being involved with something important.

A sense of 'being official' alone can be important in participant recruitment. A study by Boyd et al. (2015) demonstrated that participatory response is greater when more professional appearing participatory equipment is provided rather than more plain standardised versions. Alongside this, an increase in infrastructural support can increase access to potential participants. An ongoing study by Wild et al. (2018) aims to recruit paramedic students across seven universities. The researchers in this study believe that

this will help them to obtain the statistically recommended 570 participants that they need. In order to try and attain a larger sample size for this feasibility study, I contacted other universities in the North West of England. I provided an overview of my project and asked if they would be interested in allowing their paramedic students to participate. These universities redirected my email to other individuals who eventually lost contact altogether. Thus, I believe that an extension of this study, if conducted, would benefit from being part of an official organisational project rather than simply a study for a PhD project.

Another tactic that may potentially increase participation is to have a paramedic assisting with recruitment, discussing the proposed research with paramedic students prior to inviting them to participate. Both previous research (Essex and Benz-Scott, 2008; Mildenhall, 2012b) and the online forum study in this thesis (see Chapter 7) suggests that paramedics prefer to discuss mental health issues and work stress within their own work culture. Therefore, it is likely that they would be more willing to participate in a related study if they are asked to do so by a paramedic rather than an independent researcher. In the UK, paramedic training has only recently transitioned from an in-house vocational apprenticeship model of training into a pre-employment university degree qualification (Devenish, Clark & Fleming (2016). It may therefore take more time for a more research-oriented culture to be embraced in this professional context; one which fosters more enthusiasm for involvement in research (Siriwardena et al., 2010). Having current paramedics facilitating recruitment can help encourage participation of paramedic students, especially with more sensitive subjects such as work trauma and PTSD.

Having stronger ties and official collaboration can additionally help increase the number of potential eligible participants through recruitment from other universities.

During this study, I contacted other universities in the North West of England with paramedic courses, asking if they would be interested in collaboration and allowing their paramedic students the opportunity to participate. Initially, the contacted individuals expressed interest and passed on details to other relevant people in their department. However, communication with these other universities broke down, and I was not able to arrange for the study to be conducted with their paramedic students. If tactics such as official collaboration and using other paramedics to present the research are implemented, then this could make collaboration with other universities more likely to be successful.

Further methods could be employed to improve participation in the study. Forms of incentives could be used as long as this remains ethical (Head, 2009; Williams & Walter, 2015). For instance, the ongoing study by Wild et al. (2018) compensated participants for their time with £30. Thus, incentives such as this may be an option if this is capable of increasing participation (Fry et al., 2005). While some studies suggest that contacting participants by phone may help yield more responses (Boyd et al., 2015), it was felt that contacting participants by email was advantageous in terms of helping to provide them with privacy when completing the psychometric measures. The measures contained sensitive data, and the paramedic students may have been less comfortable completing these in the presence of another individual. All responding participants in this feasibility study chose to respond by email, as opposed to a booked room on the university campus, which was also a provided option. While contact with participants by email may possess issues with retention due to the participants perhaps not checking their emails as frequently as the experimenters would like (Koo & Skinner, 2005), it was an advantageous aspect of this feasibility study in order to provide the paramedic students with privacy. Hence, a large-scale study if conducted in the future may consider retaining this aspect.

Stigma and negative attitudes towards mental illness in paramedics tend to be commonplace across workstations (Haugen, et al., 2017; Quaile, 2016). Therefore, this stigma may have also been present to a degree in the paramedic students, hence the relatively low participation. This would further explain the disproportionately larger number of female participants in this study (four females to one male included in the final results), as this stigmatisation effect tends to be more frequently observed in males (Chandra & Minkovitz, 2006). One additional method to possibly help increase participation could be to disguise the true purpose of the study during recruitment. For instance, the study could be presented as a test of mental preparedness, rather than work trauma and PTSD. This would not necessarily be untrue, as the study is aiming to build resilience in paramedics; this approach would thereby emphasise the resilience and preparedness aspects and avoid the terms 'work trauma and PTSD' during recruitment. On the other hand, this would most likely still be deemed as a form of deception. Generally, deception is not acceptable unless it is necessary to obtain unbiased information (Tai, 2012). Therefore, this approach may be justified if the researchers believe that social desirability bias may be a confounding factor. For instance, one may argue that due to the stigma towards mental health often observed in paramedics (Haugen et al., 2017; Quaile, 2016) their responses to the psychometric measures may be biased if they know the study is specifically researching work trauma and PTSD. It would be most preferred to not withhold important information from participants if a larger extension of this feasibility study is performed in the future. Nevertheless, different ideas can still be considered.

Other methods could be used to reduce the stigmatisation of mental distress in paramedics. The online forum study in this thesis (see Chapter 7, Sections 7.1 to 7.11) suggested that paramedics often prefer to view and explain mental distress through biological explanations rather than psychological. As well as complying with the fact

that their profession is strongly related to the biological, biological approaches to mental illness may reduce stigmatisation (Corrigan & Watson, 2004; Phelan, 2002). The ongoing study by Wild et al. (2018) plans to obtain biological measures related to mental health, as well as psychometric measures. These biological measures include smoking, alcohol use, salivary cortisol, weight gain, plasma levels of c-reactive protein and sleep problems. These biological factors are frequently associated with mental distress (Degenhardt & Hall, 2001; Eraly et al., 2014; Hamer, O'Donnell, Lahiri & Steptoe, 2009; Korkeila et al., 1998; Pederson et al., 2015).

Therefore, a future extension of the feasibility study may consider adopting a more biological approach towards forms of mental distress such as PTSD in order to further encourage participation from paramedic students. On the other hand, such testing may also be perceived as intrusive, and put off some potential participants. The feasibility study investigated a sensitive subject in the context of a vulnerable population. Obtaining ethical approval for this feasibility study from the UCLan STEMH Ethics Committee was challenging, and concessions were made to allow the study to go ahead. However, this feasibility study was conducted smoothly, and no participants reported any ethical concerns or distress. Therefore, an ethics committee may allow a main trial based on this feasibility study to go ahead more leniently.

During this feasibility study, I observed how willing the participants were with being randomised. No participants complained about allocation to their respective group. Therefore, randomisation of this sample should be feasible in a main trial. Due to the small sample size obtained in this study, I could consider allowing participants to choose their allocated group in the main trial. Participants who feel that they are too busy with their work to engage with the STDRT may opt for participation in the less taxing control condition. Likewise, participants who are more enthusiastic about the

research subject may opt for the experimental condition, rather than be deterred from participation with the risk of being randomised into the control group. This may however result in cluster effects. This is whereby the non-randomisation of participants into groups may result in confounding variables based on traits that made the participants more likely to choose one group over the other (Hedges & Citkowitz, 2015). For instance, if the participants in the main trial were to choose their group, those with a prior interest in mental health and psychology may choose the experimental group while those who are working more and being more exposed to work trauma and fatigue may choose the less time-consuming control group. For the main trial, the benefits and drawbacks of having non-randomised participant allocation needs to be weighed against each other.

As the main trial of this feasibility study would aim to measure the impact of resilience in preventing increases of mental distress, the participants in this study would ideally have no prior exposure to critical work events. An aim of this feasibility study was to learn when the first stage of the study would need to be done to ensure that the participants had not yet been exposed to critical work events. While the possibility of traumatic life events outside of the workplace cannot be controlled, a main trial can control critical work events by ensuring that the data collection in the first stage is done so before the paramedic students undergo practical work experiences. Participants reported in their feedback sheets that they had indeed had prior work experiences within their course. With their course beginning in September 2017, the participants reported that they had placements fairly soon after; from late October to early November in 2017. Additionally, they had placements early January to mid-February 2018. Therefore, the paramedic students underwent practical work experiences before the commencement of the feasibility study. Of the seven participants who completed stage 1 of the study, six reported a traumatic critical event on the DTS. The exact events

cannot be reported for ethical protection, but this shows that in a main trial, stage 1 of that study would need to be conducted within the first month of the paramedic students beginning their course. This is to minimise the possibility that the paramedic students do not have any prior exposure to traumatic incidents at the beginning of the study.

9.4.3 Psychometric Measures.

An important aim of the feasibility study was to assess the suitability of the psychometric measures that were used. The DTS was used to measure PTSD derived from a traumatic experience. The CIS measured chronic work fatigue within the past two weeks. And the CD-RISC-25 measured psychological resilience.

For measuring resilience, the CD-RISC-25 was largely a suitable measure for this feasibility study. One key advantage was the ease at which this could be completed. The measure only took 10 minutes to complete, and no participants raised any concerns or asked any questions to help further explain the CD-RISC-25. Scores from this measure were considered to be in the normal range for the paramedic students. The experimental group possessed scores of 82.33 in stage 1 and 86.67 in stage 3, while the control group possessed scores of 73.50 in stage 1 and 74.50 in stage 3. These scores were considered in the range for the general population (Connor, 2012; Fjeldheim et al., 2014; Froutan et al., 2018). The unpublished manual by Davidson and Connor (2017) suggests that the participants in this feasibility study generally scored higher than other college and university students participating in other studies. As previous research has used the CD-RISC-25 in paramedics and found this to be useful, the same was expected in this study.

On the other hand, as the CIS had been only used once before on a study with paramedics (van der Ploeg & Kleber, 2003). Similarly, the DTS has also only been used once with a group of paramedics (Fjeldheim et al., 2014). Therefore, the results of this

feasibility study with regards to the CIS and the DTS would be more imperative than the CD-RISC-25. Participation size was too low to make comparisons regarding the normality of the distribution of scores for the CIS and DTS. For the CIS, the scores were compared to the one previous research using both this measure and a sample of paramedics. The scores that the control group participants obtained on the CIS were higher to that of the one previous study conducted on paramedics (van der Ploeg & Kleber, 2003) across both start and end of the study, while the experimental group obtained more similar scores to this previous research. Therefore, across both this study along with the research by van der Ploeg and Kleber (2003), the CIS appears to be suitable for paramedic students in terms of scoring distribution.

For the DTS however, the scores appeared to be at floor levels. Figures 8.54 to 8.65 have their proportion axis fixed at 0.3 in order to help highlight any effects. Most participants reported traumatic work events in the DTS, but this did not appear to have too much of a detrimental impact on their wellbeing according to the DTS scoring. This floor effect observed in the DTS may be a testament to the notion that paramedics tend to be resilient individuals to begin with, hence they chose this field to begin with (Clompus & Albarran, 2015). It could also be argued that while the experiences of the paramedic students during their placements was at times distressing, it may have not been intense enough to select the DTS as an appropriate tool. The work experiences of a paramedic are frequently referred to as secondary traumatic events (Regehr, Goldberg & Hughes, 2002). The initial assessment of the DTS was conducted on victims of direct traumatic events, including rape victims, war veteran and Hurricane Andrew victims (Davidson et al., 1997). Hence it is possible that an alternative measuring scale more suitable for paramedics is required if an extension of the feasibility study is conducted.

The participants in this feasibility study appeared to complete both the CIS and the DTS in the end with no issues. However, initially one participant stated that they had not been on placement for seven weeks, and therefore their last traumatic incident that was troubling them the most was before the timeframes given for the CIS (past two weeks) and the DTS (past one week). I informed the participant that while they can use an incident from before the time frames, their responses have to be based on how they felt within the past week. While most participants felt that these time frames were suitable, as stated in the feedback sheets (see Figure 8.53), one participant ticked 'I am not sure' for both the CIS and DTS. This participant also wrote within the feedback, "perhaps a longer timeframe because we can go several months without a trauma/ 'real emergency'." Given that paramedics can endure trauma symptomology derived from multiple incidents spanning across a greater period of time (Kleim & Westphal, 2011; Mildenhall, 2012a; Regehr, Goldberg & Hughes, 2002), it may be more suitable to develop a single psychometric measure capable of measuring PTSD more specific to paramedics.

9.4.4 Proposal for a New Measure of PTSD in Paramedics.

Devising a new psychometric measure aimed at measuring the mental distress more specifically associated with paramedics would be a valuable addition to a main trial based on this feasibility study for a number of reasons. Firstly, a new measure would be able to be based on the more recent DSM-5. This is important, as diagnostic tools work more effectively and accurately when based on the most current diagnostic framework (Whiting, Costello & Williams, 2019). According to the APA (2019), the only psychometric measure for PTSD based on DSM-5 that does not require the addition of a structured interview is the PCL-5. As highlighted in Chapter 7, Section 7.16.1, the PCL-5 was not entirely suited for this feasibility study and the participants.

The PCL-5 required administration and interpretation by a clinician rather than a research student (Bovin et al., 2016; Weathers et al., 2013). Additionally, this measure provides no scale for severity, which is identified as a key component of the distress experienced by paramedics (Whiting, Costello & Williams, 2019). Therefore, it is imperative that a new psychometric measure for PTSD in paramedics is created based on DSM-5, while also utilising a separate scale for severity as well as frequency as done so in the DTS.

In Chapter 2, Section 2.7 of this thesis, I argued that the criteria for PTSD in DSM-5 allowed the definition of PTSD to become closer to that experienced by paramedics. This is largely down to two factors. Firstly, DSM-5 updated the criteria for trauma exposure that leads to PTSD. Criterion A in this edition now has a fourth subtype which states that ‘experiencing repeated or extreme exposure to aversive details of the event(s), (e.g., first responders, collecting body parts; professionals repeatedly exposed to details of child abuse)’ can lead to a diagnosis of PTSD (APA, 2013; Pai, Suris & North, p. 3). This new diagnosis criterion is compatible with research which suggests that paramedics can suffer from mental distress akin to a traditional view of PTSD through repeated and chronic exposure to traumatic events at work (Quaile, 2016; Regehr, Goldberg & Hughes, 2002; UNISON, 2013). Secondly, the DSM-5 provides an addition of symptomology based on negative alterations in cognitions and mood, i.e. affective symptomology, under Criterion D (APA, 2013; Spitzer, First & Wakefield, 2007; Succi, 2017). This is congruent with research which suggests that the expression of trauma symptomology that some paramedics endure is often characterised by affective symptomology as much as it is by hyperarousal symptoms (Crampton, 2012; Dodd, 2017; Kleim & Westphal, 2011; Shakespeare-Finch & Savill, 2013). Researchers such as Chu (2010), Lanius et al. (2010) and Cloitre et al. (2013) advocate that chronic

forms of trauma like that often experienced by paramedics' results in PTSD characterised more by affective symptomology.

Therefore, a new measure of PTSD should account for both PTSD characterised by hyperarousal symptomology as a result from acute traumatic incidents, and PTSD characterised by affective symptomology as a result from chronic traumatic incidents. The PCL-5 appears to fulfil this requirement by possessing a large proportion of its diagnostic questions based on Criterion D (Weathers et al., 2013). More research is required to fully assess the suitability of this scale for paramedics. However, this feasibility study suggested that allowing the paramedic student participants to complete the psychometric measure in their own time themselves, rather than in a booked slot in order to conduct a clinical interview, was advantageous. The paramedic students in this feasibility study all opted for the option to complete the scales in their own time, many stating that they were busy with their work, and this option was more ideal for them. Therefore, as well as including a separate scale for severity as well as frequency, a new scale for PTSD in paramedics would ideally be capable of completion without a structured interview or with the guidance of a qualified clinician. This of course would mean that a gold standard of PTSD diagnosis is not possible, but it would provide a quick and sufficient measure for a main trial study.

The development of a new scale suited to the PTSD associated with paramedic practices and experiences would additionally be useful for statistical reasons as well as the aforementioned practical reasons. This feasibility study used separate scales for PTSD (DTS) and chronic work stress (CIS). With the included subscales, there were 12 dependent variables included in the MANOVA. Tabachnick and Fidell (1996) state that having too many dependent variables in a MANOVA can make it more difficult to meet the assumption of homogeneity of variance, makes results more difficult to interpret,

and reduces the power of the statistical tests. Having a psychometric measure that fully encompasses the range of PTSD associated with paramedics can help reduce the number of separate dependent variables in the MANOVA, and make the output more statistically powerful, easier to interpret, and reduces the likelihood of violated assumptions. As well as proposing the development of a new measure, an additional lesson learned from this feasibility study is to consider using only the main scales of a psychometric measure rather than including the subscales in order to reduce the amount of dependent variables, making the properties of the MANOVA less stable. Having too many dependent variables additionally increases the number of pair-wise comparisons, making the adjusted significance level difficult to meet (Tabachnick and Fidell, 1996).

9.4.5 General Patterns of Results.

In feasibility studies, hypothesis testing is not a requirement, according to the NIHR (2019). While I have used the NIHR's (2017) definition of a feasibility study to guide my feasibility study, I additionally felt that it was important to provide an interpretation of the results and outcomes.

While the feasibility study focused primarily on obtaining estimates of parameters to be evaluated for the development of a main trial (NIHR, 2019), the general pattern of the results themselves were observed. Sample sizes were too low to make any statistical assumptions. With three participants in the experimental group and two in the control group by the end of the study, parametric statistics were not capable of identifying a significant effect of the condition on the dependent variables. Therefore, it cannot be claimed that these results are independent of the effects of individual differences, or that they are representative of all paramedic students. While theoretical implications were made with regard to the pattern of results, these are interpreted as

what may be observed in a main trial that could contribute to the hypotheses for this, rather than being presented as meaningful results in their own right.

9.4.6 Resilience.

The CD-RISC-25 aimed to measure psychological resilience in the paramedic students. At stage 1, the results for both the experimental and control participants were within the expected range for neurotypical individuals (Connor, 2012; Fjeldheim et al., 2014; Froutan et al., 2018). The pattern of results suggested that the experimental group possessed greater CD-RISC-25 scores than the control group. However, this was not mediated by the within factor of Time, as the experimental group displayed greater scores than the control group at both the start and the end of the study. Therefore, it appears that the small sample size contributed to individual differences affecting this study, and the experimental group participants were inherently more resilient than the control group.

Both the experimental and control group displayed an increase in CD-RISC-25 scores between the start and end of the experiment. This concurs with the findings by Gayton and Lovell (2012), who demonstrated that resilience increases in paramedic students the further into their training they undergo. The paramedic students therefore appear to have become more psychologically resilient from their work placements they engaged with between April and October 2019. However, the experimental group possessed a greater increase between the start and end of the study compared to the control group. The experimental group displayed an average increase on 4.34 points on the CD-RISC-25, while the control group displayed an average increase of 1.00. This may suggest that the STDRT had an effect on increasing the resilience of the experimental group.

It may however be possible that participant bias was an issue that affected the responses from the experimental participants. The STDRT might have made the experimental group more familiar with the hypothesised components of resilience, and therefore in stage 3 they completed the CD-RISC-25 in a manner to display resilience without actually attaining it. This would represent a form of participant bias, where the respondent aims to provide what they believe is the 'right answer' without it being representative of their mental state (Hoyt, 2002). On the other hand, the encouraging responses from the feedback sheets suggested that the STDRT is likely to have had some form of actual impact.

9.4.7 PTSD.

In this feasibility study, the DTS produced scores at floor level. Hence, a key finding from this feasibility study was that the DTS may not be suited for a main trial on paramedics, and a new psychometric measure of PTSD is required that more closely reflects the nature of PTSD in paramedics as outlined in DSM-5.

While no definitive conclusions can be made with a sample size this small, and with the scores at floor levels, there were still observable decreases in the DTS scores at stage 3. This decrease in scores was generally the same for both the experimental and control conditions. Therefore, the mental wellbeing of the participants, as measured by the DTS, improved after 6 months and course placements regardless of the effect of the STDRT. This finding may support studies that have reported improvement in resilience for paramedic from working in their profession over time (Gayton & Lovell, 2012). This may also represent support provided in the university setting.

The one observed increase in the DTS was in the Avoidance/Numbing subscale for the experimental participants. The control participants showed a decrease on this subscale, resulting in a near statistically significant interaction that was not hypothesised

prior to the study. Explanations for this increase in the experimental participant's scores may be interesting. It may be possible that the STDRT, in attempting to teach resilience to paramedics, has taught these participants to avoid facing their traumatic experiences. This follows a criticism of work incident interventions such as CISD, which has been linked to increases in psychopathology of first responders due the procedure intervening with their own coping mechanisms (Bledsoe, 2003). This potentially means that the STDRT may result in less healthy psychological mechanisms.

However, a question that can be raised from this is: Is avoidance necessarily a bad psychological mechanism for paramedics, or is avoidance actually linked to resilience? An ongoing study by Wild et al. (2018) suggests that rumination (repetitive negative thinking) is associated with low resilience and poor mental health in emergency workers. Avoiding thinking about critical incidents is additionally reported to be a frequent coping mechanism in paramedics (Mildenhall, 2012a). Therefore, the increase in avoidance from the experimental participants may be a positive element to help deal with critical incidents, and the DTS is falsely including elements that are associated with coping rather than traumatisation. This does not necessarily include all the avoidance/numbing questions on the DTS. For instance, "*Have you felt distant or cut off from other people?*" is likely to still be associated with trauma. Questions such as "*Have you been avoiding any thoughts or feelings about the event?*" may be more associated with resilience than traumatisation. On the other hand, some studies suggest that PTG is associated with cognitive processing or accepting that the incident cannot be changed, rather than avoidance (Chopko & Schwartz, 2009). Further research is needed to explore and clarify the role of avoidance in resilience and PTSD. It should be restated that the participants are still paramedic students, and the 6-month period of stage 2 is a relatively short time to be measuring the effects of work trauma on one's mental health.

The effect on work stress and psychological resilience on mental health in paramedics can take years to sufficiently estimate (Gayton & Lovell, 2012).

9.4.8 *Chronic Work Stress.*

The CIS was included in the study to measure the effects of chronic stress and trauma in the paramedic students for this study. This was done so to cover all aspects of traumatology, with the DTS measuring the effects of acute trauma. The feasibility study showed that the control group consistently had higher scores than the experimental group at both stage 1 and stage 3 for both the total score and all subscales of the CIS. This particular effect is likely due to individual differences. It was also observed that the CIS scores generally increased between stage 1 and stage 3, although decreases were observed for the control group in the Fatigue and Physical Activity subscales. Nevertheless, the fact that the experimental group did not show any decreases or a less profound increase compared to the control group is an interesting observation. While it appears that the STDRT and experience working in paramedic practice possibly provided an increase in resilience (measured by the CD-RISC-25) and decreases in acute traumatology (measured by the DTS), these effects do not result in improvements in chronic traumatology, fatigue, and stress. This could indicate that psychological resilience had a buffering effect on acute traumatic experiences, but not chronic stressors.

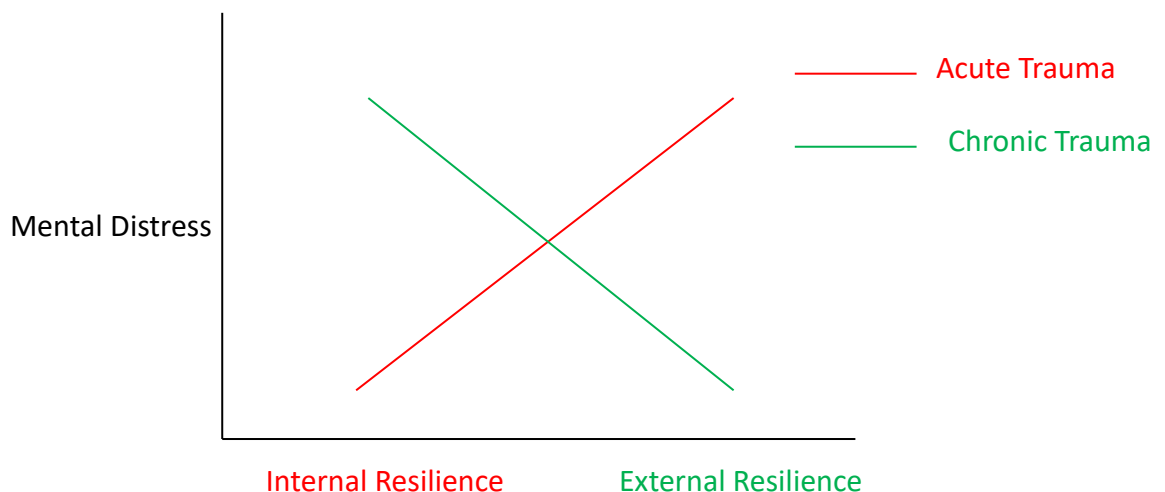
9.4.9 *Theoretical Implication of the Feasibility Study: Hypothesised Interaction Between Resilience Types and Trauma Types.*

Following from the results of the feasibility study and a subsequent review of the literature with these results in mind, it could be hypothesised that psychological resilience helps to buffer acute traumatology and positive PTSD, while external resilience factors helps to buffer against chronic stressors and negative PTSD. While the

STDRT did aim to include external resilience components, this was difficult to fully incorporate into the STDRT, especially given that this prototype was not built on software more powerful than Microsoft PowerPoint (see Chapters 6 and 8). Hence the STDRT was likely to have had a greater effect on internal factors of resilience rather than external factors. Increasing a paramedics' psychological resilience may help them deal with intense traumatic work experiences better. But it may not be able to ultimately help them with longitudinal environmental issues such as working 12 hour shifts without a break, not being given any choice in which shifts they have, treating a large number of injured patients and transporting them to the hospital in a restrictive time frame (UNISON, 2013), having their retirement age increased to 65 (UNISON, 2015), a lack of a sense of community (Pietrantonio & Prati, 2008) and having a lack of recovery time between incidents (Alexander & Klein, 2001). Thus, while improving individual psychological resilience may help, environmental changes in paramedics still need to be improved to help combat chronic stressors and negative PTSD. Therefore, the hypothesis I proposed asks if internal resilience offers more protection from acute trauma, while external resilience offers protection from chronic trauma. This is illustrated in Figure 9.1.

Figure 9.1

A hypothetical graph to help illustrate the hypothesis resulting from the feasibility study



There is no study evaluating this hypothesis directly. From the literature, there are several studies that can indirectly provide some evidence towards this hypothesis. For paramedics, the literature largely suggests that internal resilience does help to protect against the PTSD caused by acute trauma. Streb, Haller & Michael (2014) found in their regression analysis that resilience and the sub-factor sense of coherence were negatively correlated with PTSD symptoms. Other studies have shown similar results to this (Kirby, Shakespeare-Finch & Palk, 2011). Regehr, Goldberg and Hughes (2002) highlight an association between cognitive strategies and resilience to critical incidents. These cognitive strategies included visualization and processing the related information and facts in an objective manner. Ogińska-Bulik & Kobylarczyk (2015) similarly found that internal resilience factors such as planning, sense of humour and acceptance were associated with resilience and PTG in the aftermath of critical incidents in paramedics. These internal resilience components have been shown to increase with age and experience (Gayton & Lovell, 2012; Shrestha, 2015), and may be associated with biological factors such as neurological structures, neurotransmitters and genetics (Bowirrat et al., 2010; Heinzelmann & Gill, 2013).

Thus, the research literature suggests that internal resilience does indeed help to buffer against PTSD caused by acute trauma. Possessing the right cognitive mechanisms through experience or natural individual differences can help make certain paramedics less likely to develop PTSD in the face of an acute traumatic work event.

There is however less research investigating internal resilience and PTSD onset by chronic trauma. A questionnaire study by Gayton and Lovell (2012) found a significant correlation between resilience and overall well-being, as measured by the Satisfaction With Life Scale (SWLS) (Diener, Emmons, Larsen & Griffin, 1985). Given that those suffering from chronic trauma and work stress are less satisfied with their life

as a whole (Nirel, Goldwag, Feigenberg, Abadi & Halpern, 2008; Sprang, Clark & Whitt-Woosley, 2007), the correlations in the questionnaire study by Gayton and Lovell (2012) may suggest that internal resilience does indeed help buffer against chronic work stresses. Similarly, Alexander and Klein (2001) found significant negative correlation between resilience (as measured by the Hardiness Scale) and burnout (measured by the Maslach Burnout Inventory, MBI). Burnout is another associated factor of chronic trauma (Newell & MacNeil, 2010).

Contrary to the hypothesis I proposed, the research literature suggests that internal resilience appears to possess a buffering effect on chronic trauma as well as acute trauma. Further research is required to investigate this further, while negating mediating factors if possible. For example, it is likely that internal resilience and external resilience are inter-correlated with each other (Shaw, Scully & Hart, 2014). Hence, internal resilience may not be directly associated with protection from chronic stress, but associated with external resilience, which is in turn associated with chronic stress.

The hypothesis resulting from the feasibility study additionally states that external resilience provides a buffering effect from chronic trauma. Essentially, this hypothesis asks whether paramedics having sufficient support systems around them help deal with repeated exposures to work incidents that are associated with negative PTSD. Most studies highlight this, reporting that poor external resilience leads to higher levels of chronic trauma aspects. Dodd (2017) highlights how the already stressful work experiences that paramedics undergo are exacerbated by lack of emotional support from supervisors and delayed or forced debriefing after critical incidents. Similarly, Regehr and Millar (2007) argue that the emergency service organisation itself is the greatest cause of distress in paramedics, more so than the traumatic work exposures. The results

of their questionnaire study support this argument. Paramedics reported intense time demands, little control over their work, low resources and lack of support from supervisors as the being especially distressing experiences. Those who possessed social support from their peers claimed to fare better with their day-to-day work struggles. Thus, Regehr and Millar (2007) argued that paramedic supervisors and employers need to be doing more to improve this external environment.

Qualitative analysis by Clompus and Albarran (2015) demonstrated that low social support and high work demands not only contributes to chronic trauma itself, but also interferes with their coping mechanisms related to external resilience such as support from co-workers. The research overall suggests that low levels of external resilience is associated with increases in mental distress in paramedics over chronic durations of their work life. It seems apparent that external resilience is indeed related to chronic trauma. Further research is needed to assess if directly manipulating the external environment has an effect on chronic trauma. Ideally for the paramedic's own well-being, this study should observe if improving their external environment helps reduce chronic trauma and PTSD.

If external resilience appears to have a buffering effect against the chronic trauma that paramedics experience in their work, does that mean it also has a buffering effect against acute traumatisation, or is there a double dissociation as the researcher's hypothesis suggests? Coping mechanisms related to external resilience are commonly used among paramedics. Studies have suggested that paramedics often prefer dealing with traumatic events by engaging with their own co-workers and occupational culture (Mildenhall, 2012b). Paramedics were reported to using humour and story-telling with their peers to help deal with stressful situations. Despite this coping mechanism being commonly used by paramedics in the face of traumatic work experiences, does it help

reduce rates of positive PTSD? The related literature is currently inconclusive and mixed. Regehr, Goldberg and Hughes (2002) found in their sample of paramedics that perceived social support was not significantly associated with levels of symptoms of traumatic stress and depression, as measured by the Impact of Event Scale (IES) and the Beck Depression Inventory (BDI). Similarly, the multiple logistic regression performed by Wild et al. (2016) did not find a significant correlation between social support (both work and general) and PTSD or major depression. These examples may suggest that external resilience factors such as social support do not offer a buffering effect for a traumatic life event associated with PTSD.

However, some studies suggest that external resilience may be associated in protection from acute trauma and positive PTSD. The literature review by Kleim and Westphal (2011) suggests that social support was in fact one of the best predictors for PTSD following difficult acute traumatic events. They report that in the face of traumatic events, those with stronger social supports networks were less likely to develop PTSD. While only one study included in their review was based on a sample of EMS workers (Weiss, Marmar, Metzler & Ronfeldt, 1995) the other studies and their participant samples are most likely to be applicable. Additionally, it is suggested that if other factors of external resilience are reduced, then this may worsen acute traumatic experience. Alexander and Klein (2001) note that while paramedics find the psychological impact of injured or dead children to be among the most stressful experiences they can face, this is worsened if they do not have sufficient time to recover from these events. Thus, having an overly intense work environment that does not allow paramedics to deal with acute traumatic events may increase the likelihood of positive PTSD. Once again, further research is required to explore this area more sufficiently.

Further research is required to investigate the potential double dissociation between acute and chronic traumatology, and internal and external resilience. No study has yet tested this hypothesis directly, and the more indirect studies on this topic are fairly mixed. The literature does seem to suggest that the double dissociation may not be so strict, if it exists at all. Studies tend to show that both forms of resilience are associated with protection to both forms of trauma. It is possible that while both forms of resilience help overall, internal is a more powerful buffer for acute trauma, while external is a more powerful buffer for chronic trauma. Alternatively, this hypothesis may be erroneous.

9.5 Summary of Discussion Chapter

A discussion has been provided for the results of both the feasibility study and the online forum study. The online forum study provided insightful information, especially for building the second version of the STDRT. The feasibility study overall suggested that a main trial for the STDRT on a sample of paramedic students is feasible, though methodological improvements are required. The results provided further insight into the nature of PTSD and resilience in paramedics that provided new hypotheses and theories that could be discussed. Additionally, my project comprised a number of different studies which, taken together, provide a number of outcomes that can be discussed to highlight the implications for future research in resilience, work stress and trauma in paramedics. The next chapter will provide a general discussion of the different studies in my project.

CHAPTER 10: GENERAL DISCUSSION: IMPLICATIONS AND FUTURE DIRECTIONS

This research has used a sequential exploratory design in developing a resilience training tool using qualitative data collection, followed by a quantitative study to perform a feasibility study of this. The initiation of this study was variously justified. Firstly, I presented a history of PTSD from original diagnoses in military contexts to diagnoses in other populations such as paramedics, and how the differences in new classification systems allow for new approaches diagnosing PTSD. Secondly, I have summarised the narratives provided in grey literature, which largely suggests that work stress and mental distress in paramedics have worsened since 2008. And thirdly, I have conducted a narrative literature review which highlights the research literature of trauma and PTSD in paramedics, as well as highlighting the potential for resilience training and DPFPSH to help alleviate forms of mental distress. While these three sections in their respective chapters build to justifying the implementation of my sequential exploratory study, they also represent in their own right original contributions to knowledge presented in this research. The original contributions displayed throughout this project will be discussed in this chapter, along with the theoretical implications and future directions.

10.1 A Historical Documentation of PTSD in Paramedics

In Chapter 2, I provided an outline of historical and conceptual issues of PTSD, with applications to that of diagnoses in paramedics. This discussed how DSM-III was initially used to diagnose PTSD in the military, before the DSM-IV version facilitated diagnoses in other populations such as paramedics. I then discuss recent ideas about chronic exposure to work stress and trauma resulting in forms of PTSD more characterised by affective symptoms (Chu, 2010; Cloitre et al., 2013; Lanius et al.,

2010). I also discussed how the more recent classification systems DSM-V and ICD-11 allowed diagnosis of these forms of chronic PTSD to be made.

As noted by Whiting, Costello and Williams (2019), paramedics are an understudied group with regards to PTSD vulnerability, especially compared to war veterans, and the various manifestations of PTSD in paramedics have not been historically well documented. Chapter 2 provides a historical documentation of PTSD in paramedics that helps account for an overall gap that has been noted across research. Additionally, Chapter 3 suggests that in the UK, and other countries such as Canada, the chronic exposures to stresses that paramedics face are increasing and worsening. This further highlights the importance of having diagnostic systems that can account for this chronic aspect of trauma exposure that can contribute to a diagnosis of PTSD.

A theoretical implication observed across a number of areas in this project was the apparent need to develop a psychometric measure to diagnose PTSD specifically in paramedics. The history and conceptual issues of PTSD chapter highlighted how the mental distress experienced by paramedics is often characterised by affective PTSD due to their chronic exposures to vicarious trauma. This notion was further supported in the grey literature chapter and the online forum study, which both showed frequent observations of paramedics citing chronic exposure to stress and trauma as being the main concern in their profession. However, the methodology of the feasibility study noted that it was difficult to obtain a psychometric measure for PTSD that was completely suitable for that particular study with paramedics. I identified the DTS as being most suited to the feasibility study. Despite this being based on DSM-IV, it possessed separate scales for frequency and severity, which I felt made this particularly suited to the mix of acute and chronic stressors that paramedic often face. However, the results of the feasibility study showed that the scores of the DTS were at floor levels.

While this study was conducted on paramedic students rather than full-time working paramedics, the participants generally scored fairly high on the CIS. This suggests that the DTS may have not been best suited for the paramedic students in this study.

Therefore, a theoretical implication of my project is the need for a psychometric measure that possesses a number of qualities to make this suitable for paramedics.

Future research will be needed to help develop more exact specifications for this. There are several ideas drawn from my project that can be suggested. Firstly, this should include an acceptable amount of questions relating to Criterion D in DSM-5, as this criterion outlines the affective symptoms of PTSD (Pai, Suris & North, 2017).

Secondly, this should not require a structured interview to administer, in order to make this more practical for research with large numbers of participants (Kosydar-Bochenek, Lewandowski, Ozga & Woźniak, 2016). Thirdly, the trauma exposure should closely reflect Criterion A4 in DSM-5, allowing for 'repeated or extreme exposure to aversive details of the event(s)' (APA, 2013; Pai, Suris & North, 2017, p. 3). This should also allow for the trauma exposure to have occurred across a longer time span, as paramedics may be troubled by incidents that occurred some time ago (Clompus, 2014). And fourthly, this should use separate scales for frequency and severity similar to the DTS (Davidson, 2002). Whiting, Costello and Williams (2019) note that symptom severity is often missing from PTSD diagnosis, and many studies and scales instead only focus on classifying PTSD symptoms as being present or absent.

10.2 Original Contribution and Implications of the Online Forum Study

The online forum study was one component of this project that produced a number of unique findings that contribute to its originality. Firstly, this is due to the design of the study itself. Online forum studies are a very recent research technique (Germain, Harris, Mackay & Maxwell, 2018; Mann & Stewart, 2000). The online forum study

provided a number of advantages and disadvantages compared to an in-person focus group. For example, forum users were more likely to discuss sensitive issues but it was also more difficult to obtain demographic data due to anonymity of the forum users. Additionally, while an online forum study has been used to investigate mental distress in a number of different populations (Gough, 2016; Jarrett, 2017) this technique has not been conducted specifically focusing on mental distress in paramedics to date. This methodology therefore provided an original aspect of the project that was able to further generate original research knowledge.

As online forum studies are a relatively new research technique, the lack of available guidelines can make it quite difficult to ensure that these studies are done in a perfectly ethical manner (Ackland, 2013; Sugiura, Wiles & Pope, 2017). This qualitative study researched sensitive information, and while two of the three forums used are publically available, it was important to ensure that verbatim posts without direct permission from the original forum users were not presented in this project. The techniques I used to obtain permission from the original forum users and paraphrase useful posts for presentation demonstrate valuable techniques that could be used by other researchers conducting online forum studies of sensitive research topics.

The online forum study found a number of interesting results. Some of these reinforced previous research findings, while some were unique. This qualitative research provided insight into the severity of the trauma and mental distress that paramedics often face, as opposed to quantitative research that mostly focuses on prevalence rates. For instance, a meta-analysis by Petrie et al. (2018) provides statistics on the rate of mental distress in first responders. However, this meta-analysis, as with many other forms of quantitative research, does not provide a more personal insight into the distress that paramedics face. My qualitative research, however, provided an insight

into the traumatic nature of critical incidents that paramedics can possibly face. As well as improving our understanding of their critical work incidents, this also provides further insight as to the nature of different traumas faced and resilience mechanisms that paramedics use.

Further original findings were derived from the online forum study. These include the preference for biological language over psychological concepts when discussing mental distress, the effect of realistic expectations on the likelihood of mental distress forming later, the effect of alert tones on their heart rate, and the way that paramedics used talking on the forums as a coping mechanism itself. During this study I observed that different paramedics across different forum subjects were making thematically similar points, allowing research observations to be made. Some of these findings are interesting findings that can be investigated in future studies, while others were useful to the development of the STDRT.

10.2.1 Originality of the Self-Taught Digital Resilience Training.

Another original aspect of this project was the development of the STDRT. While digital programs for psychological wellbeing are a recent invention, these have developed rapidly in numbers (Zhao, Freeman and Li, 2016). Digital programs for psychological resilience, as opposed to aiming to alleviate mental distress after the onset is an area that is not as utilised and researched (Kuhn et al., 2014). To date, there is one other ongoing study that is testing a digital application for resilience training with paramedics specifically as a population (Wild et al., 2018). However, the project by Wild et al. (2018) uses resilience factors associated with the general population. This current project on the other hand aims to use resilience specific to paramedics as a workforce. Therefore, the content and ideas used in the STDRT highlights an original aspect of this project.

The STDRT was developed using Microsoft PowerPoint, and used animations, hyperlinks and slide transitions to present information akin to a flash program. This was not powerful enough to contain more complex animations, and could not save the page the user last visited after resuming it. As I conducted this study without an advanced level of experience in computer programming, using PowerPoint was an effective method of developing a prototype of the STDRT. While PowerPoint can be used to make preliminary templates in preparation of more complex digital programs, it is not often used directly to deliver assistance with mental distress. The development of DPFPSH often requires a researcher who is skilled in both mental health research and computer programming, or a collaboration of multiple individuals contributing each of those skills (Mohr, Lyon, Lattie, Reddy & Schueller, 2017).

In this project however I successfully used PowerPoint and a sufficient knowledge of this software to be able to develop a DPFPSH without external assistance. This approach may be used by others who are looking to develop a DPFPSH for their research, but who lack the knowledge or access to computer programming skills.

10.2.3 Definition of Resilience.

Several original aspects of this project came not in the form of research findings, but in novel hypotheses derived as a result of the research. An example of this was the definition of resilience. The concept of resilience is often not clearly defined across different areas of research (Agaibi & Wilson, 2005; Cleary et al., 2018). Some researchers state that resilience is a static concept, which provides individuals with the sufficient mental processes to enable positive outcomes in challenging circumstances (Reivich, Seligman & McBride, 2011). Other researchers however claim that resilience is a more fluid concept that can change over time and circumstances (Bonanno, Romero & Klein, 2015; McEwan, Gray & Nasca, 2015). The narrative literature review and

online forum study I conducted appears to support resilience as a fluid concept rather than a static concept. Additionally, the narrative literature review suggests that there is a distinction between internal resilience and external resilience (see Chapter 5, Section 5.3.1). The results from the feasibility study generated a new hypothesis: Internal resilience is associated with protection from acute traumatic incidents, while external resilience is associated with protection from chronic traumatic incidents.

Furthermore, a key finding from the online forum study was that there are factors of resilience that are specific to paramedics as a workforce. For example, the role of compassion towards patients appears to act as a facet of resilience that applies to paramedics and not many other populations. Both the online forum research and the research literature suggest that paramedics need to find an ideal balance with regard to compassion towards the patients that they treat. Being too distant from their patients often results in an increase in mental distress for a number of reasons. Suppressing emotions through preventing oneself from mentally processing traumatic events is suggested to be associated in PTSD in the long term (Mildenhall, 2012a; Ogińska-Bulik & Kobylarczyk, 2015; Regehr, Goldberg & Hughes, 2002; see Chapter 7, Section 9.7). Also, the motivation to become a paramedic and help others is an important aspect of resilience in paramedics (Clompus & Albarran, 2015) and detachment from patients results in this aspect being lost.

This thesis therefore provides new ideas salient to conceptualisations of resilience, its role in paramedics, and how it relates to different forms of psychological trauma. I therefore propose a definition of resilience: That resilience is a fluid, plastic mental attribute derived from both internal processes and external support, existing in a reciprocal relationship with the individual's environment, which helps prevent the onset of mental distress after both acute traumatic events (such as the death of a patient in a

traffic accident) and multiple stressful events over time (such as attending multiple casualties without sufficient breaks for consecutive weeks or months). Future research can aim to test the legitimacy of this proposed definition of resilience. Caution should be taken at the present to ensure that the plasticity of the definition does not mean that it is scientifically unfalsifiable. Additionally, researchers should be aware that acute traumatic events and multiple stressful events over time are not necessarily mutually exclusive, but can coincide in the paramedics' workforce (Regehr, Goldberg & Hughes, 2002).

10.2.3 Theoretical and Practical Implications of this Resilience Definition.

This project therefore produced a number of original and novel findings. Additionally, some of these findings also provide theoretical and practical implications, such as that shown in the online forum study. The online forum study suggested that paramedics possessed resilience factors specific to their line of work. This implies that other workforces would have specific resilience factors for their professions. This idea has seldom been demonstrated in previous research. In one example, Falconer, Alexander and Klein (2013) suggest that some resilience factors in police officers were specific to that workforce, such as job satisfaction, managerial support and circumstances of the incident itself, such as having to inform the relative of a death. However, there does not appear to be other clear examples of this in previous research. Therefore, the idea of specific resilience factors to specific workforces should be considered and researched more.

Practical implications were also suggested in the feasibility study. Namely, this mostly relates to the feasibility of a main trial being conducted. Overall, this study suggested that a main trial would indeed be feasible, but considerations need to be made. The feasibility study suggested that the psychometric measures may need to be

changed for the main trial. It appeared that the DTS was not suitable for measuring acute trauma in paramedic students, and the scale showed results at floor levels. The CIS and CD-RISC-25 were suitable in terms of the sensitivity and distribution of results. However, a methodological and statistical improvement would be to have one scale more suited to paramedics that measures both acute and chronic trauma in one, as opposed to separate scales for each. This would more closely reflect the critical work events experienced by paramedics and reduce the number of variables and pair-wise comparisons used in the MANOVA. Additionally, the feasibility study also suggests that improved recruitment and retention methods are required to ensure that a large enough participant group completes this study.

Furthermore, while the statistical results of the feasibility study were provisional, they did indicate that the STDRT was associated with a greater increase in resilience, measured by CD-RISC-25 scores. While further testing is required, this does indicate that the STDRT is promising in increasing the resilience of paramedics. This may indicate that the STDRT could be used in further studies aiming to increase resilience in paramedics. Additionally, the method by which the STDRT was developed, using online forums to qualitatively analyse resilience factors specific to a vulnerable workforce, can be used with other vulnerable groups such as firefighters, refugees etc.

While the narrative literature review suggested that there was a distinction between internal resilience and external resilience, the provisional results of the feasibility study produced a new hypothesis: Internal resilience is associated with protection from acute trauma, while external resilience is associated with protection from chronic trauma. Again, this is a provisional hypothesis, one that can be further evaluated in a main trial from the feasibility study. This may suggest that as well as future research considering the different types of resilience depending on workforces

and how this resilience is formed (internally or externally), the way in which this interacts with the trauma exposure should also be considered.

10.4 Limitations

Despite the novel findings and promising theoretical and practical implications of this project, there were drawbacks. Several of these were present in the online forum study. One potential criticism was the lack of reliability check for the qualitative analysis. Researchers debate as to whether this is necessary or not (Morse, 1997; Roberts, Dowell & Nie, 2019). While a credibility check was made with the supervisory team, the absence of a second coder can be highlighted as a potential flaw, as a different researcher conducting this same qualitative analysis may draw different themes and patterns from the data. Additionally, while the online forums were accessible to paramedics and related professions all over the world, the demographic data suggests that they were largely from Western cultures, and predominantly the US. The ideas and theories drawn from the qualitative analysis was potentially limited by the lack of culturally diverse ideas that may have been expected from an online forum study.

Further limitations can be observed for the feasibility study. Most prominently, the sample size of this study was low. This in itself was useful as part of the feasibility, in that it provided a lot of information and experience germane to increasing recruitment of paramedic students as participants in a main trial. However, this meant that any interpretations of the results could only be provisional, and no definitive conclusions could be made. Additionally, the DTS as a measure of acute PTSD was not a suitable measure for the experiences of critical incidents in paramedic students, and scores from this measure were at floor levels. This further limited any patterns and relationships in the data that the feasibility study could have produced. The feasibility study was successful in obtaining parameters that would help with the development of the main

trial, which is the prime purpose of a feasibility study. However, interpretations of the results from this feasibility study are limited.

10.5 Future Directions

This thesis has provided an account of the current forms of trauma that paramedics face, and how they are able to cope with this with resilience. My research has used qualitative analysis to observe resilience in paramedics. In turn, I have used this to help develop a tool to help increase resilience in paramedics, which has been used within a feasibility study. Both these studies and my subsequent hypotheses and theories not only provide an original contribution to knowledge, but have theoretical and practical implications. I will now outline the future direction that the study of mental distress and resilience in paramedics may take. These may take the form of alternative methods of approaching mental distress to medical models, such as TIA

10.5.1 Trauma Informed Approaches.

While the results of the feasibility study cannot produce any definitive conclusions, the pattern of results suggests that there may be a dissociation between two different forms of resilience (internal and external), and two different forms of PTSD (acute and chronic). The more recent medical systems, DSM-5 (APA, 2013) and ICD-11 (WHO, 2018) both expand the definition of PTSD to account for PTSD characterised more by affective symptomology caused by chronic exposure to traumatic incidents (see Chapter 2). However, alternative models of mental distress may be used to help explain both this potential dissociation as well as the formation of mental distress in the face of traumatic critical events. Should more evidence suggest that acute traumatic incidents are associated with hyperarousal symptomology and chronic traumatic incidents are associated with affective symptomology, then it may appear that the nature of an individual's mental distress is shaped largely by the traumatic incident itself. This

mental distress may possibly be a spectrum disorder that has been categorised by medical models and research due to sociological pressures. TIA may therefore provide an alternative way of explaining mental distress caused by traumatic events.

TIA presents itself as an alternate to biopsychological models of mental illness. TIA examines mental distress by essentially placing a greater emphasis on the individual's history and traumatic stressors that have happened to them, rather than the presented symptoms (Muskett, 2013). Based on the idea that almost all individuals with mental health issues have experienced some form of trauma in their life, TIA aims to facilitate an organisational change across a whole system level through the primary focus on the individual's traumatic experiences. This would thus provide an alternative to the current system of using biopsychological models of mental illness that try and directly treat the patient's symptoms through medicalisation, labelling and 'one-size fits all' psychological treatments' (Harris & Fallot, 2001).

Some experts in this field argue that the symptoms of trauma victims are worsened by placing them into institutional psychiatry, as this replicates coercion and control that caused their mental distress in the first place (Sweeney & Taggart, 2018). Furthermore, many experts disagree with how psychiatry by nature places labels on perceived 'disorders'. Some argue that this takes away the patient's ability to process the emotions caused by the traumatic stressor efficiently (Lieberman et al., 2007). The labels essentially prevent the individual from addressing the traumatic stressor directly and the care givers from actively listening to their story, according to this theory (Bath, 2008; van der Kolk, 2003). Thus, this allows treatment methods to be better tailored to the individual, rather than imposing 'one size fits all' methods (Sweeney & Taggart, 2018). A common phrase used in this approach is that we should be asking 'What happened to you?' rather than 'What is wrong with you?' (Johnstone & Boyle, 2018a).

While this is not necessarily literal (Sweeney & Taggart, 2018), it does help to explain the overall idea behind TIA.

It could possibly be argued that according to TIA, many mental illnesses are in some way connected to PTSD if they begin with physical, psychological or sexual trauma (Sweeney & Taggart, 2018). For instance, Harris and Fallot (2001b) state that due to the association with trauma and mental illness, some hallucinatory experiences may be closer related to PTSD flashbacks rather than schizophrenia. While as a medical model, the rigidity of traditional PTSD makes it reportedly difficult to combine with TIA, CPTSD is thought of as being more compliant with TIA (Harris & Fallot, 2001b).

10.5.2 Criticisms of Psychiatry, and Potential Advantages of TIA.

TIA developed as part of a backlash to psychiatry. Advocates of this view further claim that as well as offering better treatment by first asking the distressed individuals ‘What happened to you?’ rather than ‘What is wrong with you?’ (Johnstone & Boyle, 2018a), TIA can offer explanations of mental distress that overcome the disadvantages of medical models for mental distress such as PTSD.

Diagnostic systems such as DSM argue that psychological disorders can be viewed as possessing a biological underpinning that represents the main focal point of the medical framework (Mayes & Horwitz, 2005). A common argument made by TIA is the lack of solid evidence that psychological disorders are caused primarily by a biological deficit. This critique is commonly used for schizophrenia (Cromby et al., 2013; Johnstone et al. 2018). A similar observation can be made in PTSD. A meta-analysis by Zoladz & Diamond (2013) failed to identify a prominent biological marker in PTSD. They found a wide range of different biological markers that varied profoundly with individual differences. Thus, medical models of disorders such as PTSD often lack the consistent biological markers required for medical models to

provide a consistent framework. TIA therefore hypothesises that causal pathways of mental distress run in the opposite direction from medical models; psychological trauma is directly responsible for the symptoms with the biological markers as a by-product, rather than changes in the brain structure being responsible for the symptoms (Johnstone et al., 2018).

Another criticism of psychiatry that TIA aims to help overcome is the effect of psychiatric labels. Psychiatric labels may have a wide-spanning array of effects depending on the label itself and individual differences (Corrigan, 2004; Rose, 2006; Swami, 2012; Timimi, 2014). While this is not always negative, they are sometimes associated with lower self-esteem, hopelessness and despair (Bassman, 2000). Sociologists have also noted the concept of deviancy amplification associated with labelling and great imprecision in the diagnostic application of labels (Cohen, 1964). Furthermore, criticisms have been made of how psychiatric labels are Western concepts that attempt to imply that other cultures are behind in terms of these ideas, and ignore social and cultural factors that are also embedded in mental wellbeing (Timimi, 2014).

Studies investigating labelling have also extended into PTSD. In military veterans, a diagnosis of PTSD is often associated with negative side-labels such as 'violent', 'dangerous' or 'crazy', and is also associated with delay in seeking treatment, and being blamed for their own diagnosis. Real-world consequences can include loss of opportunities for housing, work, poorer quality of primary care and poorer treatment by the criminal justice system (Ben-Zeev, Corrigan, Britt & Langford, 2012; Mittal et al., 2013). Hence, some veterans and psychiatrists believe that the actual label itself, *PTSD*, should be changed to help avoid or reduce the stigma (Szalavitz, 2011).

An important question can be raised from this: Should we be improving education and facilities around mental health issues to reduce the paramedics' shame

and stigma of being diagnosed with a mental condition such as PTSD, or should the labels derived from the medical models be dropped entirely for TIA? On the one hand, some researchers believe that with improvements in education, facilities and mental health awareness in paramedics, the stigma attached to the psychiatric labels will eventually be removed (Haugen et al., 2017; Quaile, 2016). On the other hand, advocates of TIA believe that the labels essentially prevent the individual from addressing the traumatic stressor directly and the care givers from actively listening to their story (Bath, 2008; van der Kolk, 2003). Thus, TIA allows treatment methods to be better tailored to the individual, rather than imposing ‘one size fits all’ methods (Sweeney & Taggart, 2018). Further research is required, especially focused on paramedics, to help investigate this further.

A further criticism of medical models made by TIA is the alienation of meaning. According to this, medical models essentially strip away the personal experiences and human feelings in the face of adversity by treating these responses as biological symptoms (Johnstone & Boyle, 2018a). Rather than allowing trauma victims to conceptualise their experiences in a manner that allows them to learn to accept it and adopt healthy coping mechanisms, medical models block this recovery process by medication and psychotherapies that aims to address ‘what is wrong with the individual’, rather than ‘what has happened to them?’ (Johnstone & Boyle, 2018b).

While is currently research applying this to voice hearing (Corstens et al., 2014; Longden, Madill & Waterman, 2012), there is little on the effect of TIA on providing meaning to the form of distress otherwise referred to as PTSD in medical models. While medical models of PTSD do acknowledge the prior requirement of traumatic experiences, they do not elaborate on how that particular experience integrates with the individual’s own identity. DSM-5 for instance lists four ways in which individuals may

be exposed to symptomology-resulting trauma in Criterion A (Pai, Suris & North, 2017). However, this medical model does not explore the individual's experience beyond this, and from there on the approach of DSM-5 can be seen as reductionist and symptom-focused. Therefore, an interesting approach would be to use TIA models and help paramedics affected by traumatic work events to process and understand the meaning of the critical work events themselves, rather than imposing a 'one size fits all' medical model approach.

10.5.3 Applications of TIA to Paramedics.

A literature search produced just one study to date that directly applied TIA to paramedics. This was a study for a training project designed to help foster awareness and implementation of TIA in emergency first responders in San Diego (Fried, 2012). As well as paramedics, other emergency first responders included were firefighters and police officers. Their study overall suggested encouraging and positive results from this training. A longitudinal study would however be required to truly measure the long-term benefits of TIA in paramedics.

Hypothetically, TIA could provide a novel, beneficial approach to PTSD in paramedics. In terms of effectiveness and efficacy, more studies are needed to compare the difference between TIA and more traditional approaches to PTSD. Yet, attempting to alleviate the effects of work stress and PTSD in paramedics by placing a primary focus on the traumatic stressors themselves rather than simply the paramedic's symptoms would be a worthy study to conduct.

Another interesting point would be to investigate how paramedics respond to TIA in terms of the stigma associated with mental illness. One aim of the study by Fried (2012) was to reduce the stigma of mental illness in the first responders. The positive results of the study suggest that TIA fairs well in this aspect. Again, more research is

needed to support this claim. It is possible that TIA may still elicit stigma-related issues in paramedics. Paramedics may possibly feel that experiencing mental distress due to a traumatic work experience is still shameful, or may still feel disapproval from co-workers (Haugen et al., 2017; Quaile, 2016). While TIA aims to create trauma-awareness across the institute, paramedics may still feel negatively towards this, similarly to CISD (Bledshoe, 2003). Traditional PTSD approaches appear to be fairly mixed in terms of the role of stigma in mental health. Some researchers argue that a biomedical model helps remove stigmatisation from individuals, as it attributes the symptoms to a biological cause, rather than ‘a weakness in personality’ (Haugen et al., 2017). On the other hand, stigma problems appear to still exist in a number of populations who have been diagnosed and treated with traditional PTSD approaches, such as female addicts (Covington, 2008), military veterans (Hooyer, 2012; Smith & Whooley, 2015) and ethnic minorities (Gary, 2005). It could therefore be argued that traditional approaches to PTSD, such as using DSM to diagnose, do not stigmatise in terms of the theory they are grounded in, but the actions taken after the diagnoses such as psychiatric institutionalisation and compulsory therapy sessions, which create and reinforce negative stigmas by replicating aspects of the original trauma (Sweeney & Taggart, 2018). As with other populations, paramedics may benefit from TIA if they are more removed from the negative stigmas that can be associated with mental illness categories such as PTSD.

10.5.4 Concerns and Issues with TIA.

As TIA are a recent idea to approach mental distress, the extent to which they are successful has not been largely assessed. While future research will investigate this further, there may be some drawbacks to the approach at present. One point concerns the relationship with biomedical models. TIA draws largely from the criticisms of

biomedical models while framing itself as a viable alternative to the issues such as labelling and recreating the individual's removal of autonomy (Harris & Fallot, 2001b; Sweeney & Taggart, 2018). TIA further advocates that attention should focus on the individual's experiences rather than neurological factors that have a potentially invalid causal relationship with mental distress and abnormal behaviour (Johnstone et al., 2018; Timimi, 2014). However, TIA sometimes reverts to biomedical explanations when rationalising their validity. Muskett (2013) for instance notes that trauma exposure at a young age is associated with disruptions to neural connectivity between different brain regions. This is thought to account for impairment in relationship building, mood regulation and behaviour regulation in later life. A criticism can however be made of TIA still being somewhat dependent on biomedical models (Johnstone & Boyle, 2018; Scheeringa, 2017). Additionally, some TIA advocates believe that genetic factors are influential in determining which individuals are more vulnerable to the effects of trauma (Johnstone & Boyle, 2018). While they argue that the role of trauma exposure is important, the approaches must still acknowledge that behaviour is ultimately associated with the brain's physiology. Indeed, many TIA researchers see that biology and neurology cannot be discounted even in the context of TIA. Rather, it is often a matter of emphasis.

Another criticism of TIA is that they tend to place greater focus on re-shaping society and replacing biomedical models before they ensure that sufficient evidence is in place to determine their own effectiveness (Scheeringa, 2017). While the criticism against psychiatry is profound, we should be more cautious in assuming that TIA is the correct solution. While more research is needed, TIA approaches in the last few years have already been implemented in a wide range of different areas of care (Elliot et al., 2005; Hodgdon et al., 2013; Ko et al., 2008). Thus, a lot of money and structural

changes have been made built around a paradigm that might not be more effective than biomedical models (Scheeringa, 2017).

Whether TIA is more valid than medical models is not a question that appears to be able to be answered at the present. Both approaches currently have their merits as well as their flaws. Medical models possess greater testability and refutability, but less applicability across the different range of individuals with overlapping symptomology (Tsou, 2015). TIA possess greater applicability to a range of individuals with slight differences in their overall symptomology, but less testability and refutability. While TIA diagnoses can be tested, this testability is lower than medical models due to the lack of a single theoretical model or overarching framework (Mihelicova, Brown & Shuman, 2018).

10.5.5 Summary of TIA and Paramedics.

I have outlined recent approaches to mental distress that differ from biomedical models. While TIA have not yet been applied to paramedics fully, I have outlined how they may hypothetically do so. A change in focus to place greater emphasis on personal experiences rather than neurological pathology would most likely be helpful in addressing PTSD in paramedics. This is due to the fact that mental distress in paramedics is very closely related to the critical incidents they face at work (Alexander & Klein, 2001). However, there are currently potential flaws and issues, and more research is needed to further evaluate this approach.

10.6 Conducting a Main Trial

While TIA approaches could provide stark changes to the subject of mental distress overall, future directions can also be considered for the main trial as an outcome of the feasibility study in this project. Using the parameters of the feasibility study, it is

estimated that I would need to recruit 205 paramedic students as participants at the beginning of the study, in anticipation that this would drop to 60 participants that would still provide a powerful enough trial to statistically determine any significant differences, if the null hypothesis is untrue. To obtain an initial 205 paramedic students, recruitment techniques would need to improve. This can involve collaboration with official paramedic bodies, asking a paramedic to conduct recruitment as opposed to solely the researcher, and expanding the study into multiple universities. Techniques such as these can help ensure that the target of 205 participants is met. Additionally, the feasibility study provided me with insight in using techniques to reduce the dropout rate of the study. Relying less on emails to remind participants of data collection stages and compensating participants for their time are examples of ways to improve participant retention. As well as benefitting this main trial, studies such as this can be helpful for the future of paramedic practice as a field. Paramedic practice in the UK has only fairly recently been made into a university course, and associated research culture is under-developed (Devenish, Clark & Fleming, 2016). Studies such as this can help paramedic students become more engaged with the research aspect of their university education as well as training to become a paramedic. This can additionally help improve awareness of mental distress in paramedics and help reduce stigmatisation that can sometimes be a negative factor in paramedic work cultures (Quaile, 2016).

Improvements can additionally be made to the STDRT. As a prototype made independently, this was created using Microsoft PowerPoint. While this was pragmatically sufficient for the purposes of my doctoral studies, it was highlighted in the feedback sheet of the feasibility study that a useful feature would have been for this to save the page where the user was last using it. The main trial should consider adapting the STDRT within a more powerful program capable of saving progress, as well as other functional improvements such as involving the interactive features of tasks

etc. Furthermore, while the STDRT was created using information from the narrative literature review and the online forum study, more information can be added based on other aspects of this thesis completed later. For instance, the feasibility study led to the hypothesis that internal resilience is associated with protection from acute trauma, while external resilience is associated with protection from chronic trauma. This hypothesis can be incorporated into the STDRT in some form.

10.7 Summary of the General Discussion Chapter

My project aimed to develop a digital tool for fostering resilience in paramedics using a sequential exploratory design. A qualitative study was used to develop the STDRT, followed by a quantitative feasibility study to assess the feasibility of this. While this did indeed suggest that an eventual main trial of the STDRT would be feasible with alterations in participant recruitments strategies and psychometric measures, further implications were drawn from the range of studies in my thesis.

My feasibility study suggested that the DTS was not an entirely suitable psychometric measure for PTSD in paramedics. Additionally, my chapters on the history of PTSD in paramedics and the nature of their profession in the UK since 2008 suggests that they are exposed to chronic stressors associated with PTSD characterised by affective symptoms as much as acute critical incidents. I therefore propose that a new psychometric measure is required to more accurately reflect the nature of trauma exposure and PTSD associated with paramedics. This should also reflect the latest version of diagnostic systems, such as DSM-5 and ICD-11.

While the online forum study was used to help develop the STDRT, this alone provided an original contribution to knowledge. The methodology itself was original and findings provided implications that were both important to my thesis, and also have the potential to be further studies in follow-up research. The STDRT developed in my

thesis is also an original tool that can be further tested in other studies with paramedics. A main trial can investigate this further. My research also suggested that the definition of resilience should be investigated further, and researchers should be encouraged to challenge prior definitions. The online forum study in particular suggests that resilience may be more dependent on different individuals and populations, rather than a fixed universal trait. Alternate ideas towards mental distress itself could also be considered. TIA is becoming more prominent in other areas of mental distress research such as psychosis (Johnstone & Boyle, 2018). I therefore advocate that further research could aim to apply this to PTSD and mental distress in paramedics.

Thus, as well as the main outcome of the feasibility study in developing the STDRT in a sequential exploratory design, the various contributing studies in my thesis also provide an array of interesting findings and implications that also stand on their own. My next chapter will provide a conclusion for my thesis.

CHAPTER 11: CONCLUSION

11.1 Introduction

The overall aim of this project was to lay the foundation for investigating if self-taught resilience training through a digital program could help reduce the rates of PTSD in paramedics. Before this question could be addressed, the history and definition of PTSD needed to be explored, as well as how this form of mental distress specifically affects paramedics. The digital program developed to provide the self-taught resilience training was also designed using content and information from both research literature and the online forum study. Following this, the feasibility study possessed a low sample size. However, it produced a number of encouraging results that suggest the STDRT may have the potential to improve the resilience of paramedics, and a larger-scale RCT is feasible. Follow-up research in this area may have implications for the subject of mental distress in paramedics, which may become more dependent on technological advances (Dodd, 2017).

11.2 The Definition of Resilience: What I Have Learned

Before a debate between medical models and TIA can be discussed, a definition of resilience needs to be established. Research on this area has been hindered by a lack of unified definition of resilience (Agaibi & Wilson, 2005). This is a relatively new term in psychology, and there is relatively little research examining what resilience consists of, how it is fostered, how much is due to biological factors as well as psychological, and what other mediating variables affect it. So far, research suggests that it is not a static concept, but a concept that changes over time due to factors such as neural plasticity (McEwen, Gray & Nasca, 2015) and past experience with stressful experiences (Gayton & Lovell, 2012). Furthermore, resilience appears to possess a number of different sub-components (Iacoviello & Charney, 2014). These sub-

components can be divided into internal and external factors (Clompus & Albarran, 2015; Dodd, 2017; Luthans, Vogelgesang & Lester, 2006; Reches & Sondaité, 2014).

Therefore, resilience appears to be quite a fluid concept, which is part of the reason why studies have often struggled to sufficiently define this (Agaibi & Wilson, 2005). My research, both primary and secondary, has led me to conclude that part of this complex fluidity comes from resilience being specific to the populations that they are applied to. The resilience that is typical in paramedics for instance possesses components that are unique to them as a population. The specific demands of paramedic work require specific coping mechanisms and cognitive strategies to constitute the resilience required to act as a buffer from mental distress. For example, the role of compassion towards patients appears to act as a facet of resilience that applies to paramedics and not many other populations. Both the online forum research and the research literature suggest that paramedics need to find an ideal balance of compassion towards the patients that they treat. Being too distant from their patients often results in an increase in mental distress for a number of reasons. Suppressing emotions through preventing oneself from mentally processing traumatic events is suggested to be associated in PTSD in the long term (Mildenhall, 2012a; Ogińska-Bulik & Kobylarczyk, 2015; Regehr, Goldberg & Hughes, 2002; see Chapter 7, Section 9.7). Also, the motivation to become a paramedic and help others is an important aspect of resilience in paramedics (Clompus & Albarran, 2015) and detachment from patients results in this aspect being lost.

Conversely, the online forum research and the previous research also suggest that paramedics who form stronger personal attachment to their patients are also at greater risk of PTSD. The deaths or severe injuries of patients make this experience more traumatic for paramedics if they are overly attached emotionally (Austin, Pathak

& Thompson, 2015; Regehr, Goldberg & Hughes, 2002; see Chapter 7, Section 9.7). A part of resiliency in paramedics is to obtain the balance of compassion and detachment towards their patients. Paramedics appear to exhibit greater resilience when they are able to mentally process traumatic stimuli and retain the compassion-based reasons why they take up this work, as well as maintaining a sufficient personal distance from their patients.

This fluidity of the definition of resilience combined with the lack of homogeneity across different populations is additionally suggested in other research. Falconer, Alexander and Klein (2013) investigated the role of critical incidents and protective factors in Scottish police officers. Firstly, they highlight a current shift in approach in this area from pathological models to an approach wherein responses to distress are a normal emotional reaction when proportional to the critical incident experienced. This approach possesses similarities to the ideas advocated by TIA, in that a shift away from medical and pathological models are made in favour of viewing the individual's distress as a response to their personal experiences (Sweeney et al., 2018). The study conducted by Falconer, Alexander and Klein (2013) suggested that protective factors of police officers comprised of some elements that were specific to police officers and specific to the external conditions that they were situated in. These included job satisfaction, managerial support and circumstances of the incident itself, such as having to inform the relative of a death. This research supports the current claim that resilience and protective factors vary across the populations and circumstantial situations.

This type of mental balance between attachment and detachment therefore comprises of an aspect of resilience specific to paramedics that is not applicable, at least directly, to most other populations vulnerable to mental distress. Likewise, other

vulnerable populations will most likely have different resilient factors specific to them and not for paramedics (Falconer, Alexander & Klein, 2013).

As well as the balance in compassion, there appears to be other resilience factors that are more strongly associated with paramedics than other populations, such as ‘dark humour’ (Christopher, 2015), processing mental distress with biological explanations and maintaining a balance between empathy, acceptance and avoidance. As resilience has yet to be defined properly across research (Agaibi & Wilson, 2005; Kalisch et al., 2017) it is important for related studies such as the current project to propose additions and alterations to the definition of resilience to help move towards a definition agreed on by multiple researchers. Based on the research in the current project, I propose that resilience is a fluid, plastic mental attribute derived from both internal processes and external support, existing in a reciprocal relationship with the individual’s environment, which helps prevent the onset of mental distress after both intense traumatic events and multiple stressful events over time. Many definitions of resilience tend to advocate the idea that resilience is a more rigid cognitive mechanism that depends largely on individual differences (Iacoviello & Charney, 2014; Reivich, Seligman & McBride, 2011). The current research, however, suggests that reciprocal environmental factors are important in shaping specific forms of resilience in specific individuals. This more fluid definition of resilience may also be complimentary to TIA that avoid medical models that aim to apply ‘one size fits all’ definitions to individuals with wide-spanning differences in the aetiology of their protective factors from mental distress (Cloitre, 2015). Future research can aim to test the legitimacy of this proposed definition of resilience. Caution should be taken at the present to ensure that the plasticity of the definition does not mean that it is scientifically unfalsifiable.

11.3 Digital Interventions for Resilience: Can they Help Paramedics?

DPFPSH have been used increasingly over the last decade or so. More recently, they have been used to try and teach resilience to help reduce the probability of the onset of mental distress beforehand rather than aiming to treat current mental distress with therapeutic methods. This has also recently been applied to paramedics as a population identified as being more vulnerable to mental distress (Wild et al., 2018). The original contribution of the current research project was the aim of using digital interventions to teach paramedics resilience that was based from primary source research (the online forum study), which aimed to explore resilience factors more closely associated with paramedics, rather than a generalised theory of the definition of resilience. It is predicted that digital technologies such as this will become more widely used for paramedics as well as other populations in the future largely due to its potential to increase access to mental health support (Dodd, 2017).

However, whether these digital technologies are really effective in improving mental health is an important question that research must ask. While this seems like an obvious question, digital technologies for mental health appear to have developed rapidly over the past several years without sufficient research alongside to support their effectiveness (Bakker et al., 2016; Torous & Firth, 2016; Zhao, Freeman & Li, 2016). Research is important to not only evaluate the effectiveness of these, but also to investigate any potential negative effects. For instance, it might be possible that digital interventions replace the user's already well-functioning coping mechanisms and increase vulnerability to mental distress, similarly to reports of the harmful effects of CISD (Bledshoe, 2003). Additionally, apparent positive effects may be due to placebo effects similarly to that observed in medication treatments (Torous & Firth, 2016).

Therefore, research into DPFPSH such as the feasibility study conducted within the current project is important.

The feasibility study conducted as part of this research project was limited by small sample size, floor effects for the DTS psychometric measure and a lack of homogeneity found across a number of psychometric measure responses. Nevertheless, the positive trends from the data suggested that resilience scores (as measured by the CD-RISC-25) did indeed improve for the experimental group that received the STDRT more profoundly than the control group which did not.

Additionally, the feedback responses were encouraging. Participants agreed with all the given statements about the efficacy of the STDRT and written feedback was positive. Furthermore, the features included based on the online forum research seemed to receive praise in the written feedback, such as the individual differences in response to CISD or the use of biological terminology. While definitive conclusions about the effectiveness of the STDRT cannot be made at this moment in time, preliminary results suggest that this may be effective, and a full trial for this is feasible. If a full trial was able to find statistically significant effects for the positive trends observed in the feasibility study, it would help support the current yet premature research suggesting that digital interventions can be successful (Cleary et al., 2018; Kuhn et al., 2014; Zhao, Freeman & Li, 2016). A full trial of this study, as well as the ongoing study by Wild et al. (2018) is important in investigating the role of digital resilience training in paramedics.

However, there does appear to be concerns that this would not be sufficient to help reduce mental distress such as PTSD in paramedics. Firstly, while the feasibility study suggested that the STDRT had the potential to increase resilience scores, no notable decreases for chronic work stress (as measured by the CIS) was observed in the

experimental condition. While the STDRT aimed to improve a wide-spanning aetiology of resilience associated with paramedics, the functionality of the STDRT meant that it most likely targeted internal resilience above external resilience. The only improvement observed in the CIS was for the control condition in the Physical Activity subscale. Therefore, it may be stated that increasing internal resilience does not provide a buffering effect for chronic trauma. As outlined in Chapter 10, it may be possible that internal resilience is associated with protection from acute trauma and positive PTSD, while external resilience is associated with chronic trauma and negative PTSD. However, data from the DTS psychometric measure that aimed to measure positive PTSD caused by acute trauma displayed a floor effect. Hence this hypothesis cannot be fully supported within this study.

To make matters more concerning, the grey literature over the last ten years suggests that overall chronic stressors, mental distress and long-term health problems in paramedics have been getting worse (see Chapter 3). This is thought to be due to austerity-based policies, the struggle to recruit enough paramedics to fill vacancies and an ageing population. Paramedics are being made to work longer, for less pay, with little time for breaks or developing supportive relationships with co-workers and sometimes in work cultures where discussing mental health issues is looked down upon (Campbell, 2018; Mildenhall, 2012b; Quaille, 2016; The Guardian, 2015a). Therefore, it may be viewed as unsuitable to promote DPFPSH to improve the internal resilience of paramedics when their access to external resilience is being ultimately reduced. It may even be viewed as impertinent to state that paramedics are essentially responsible for ensuring that their cognitive functioning is 'healthy' while their resources and working conditions are being made worse. As DPFPSH are still very much in their infancy as a method of treating mental health issues, research in the near future is important to assess

their potential to help alleviate issues such as this, as well as assess the limitations of DPFPSH.

11.4 The Future of Trauma and PTSD in Paramedics

The aim of this project was to test if resilience could be promoted in paramedics to help reduce the onset of mental distress such as PTSD beforehand. This was done using a feasibility study of a DPFPSH designed to increase resilience in student paramedics. However, during this project I have learned more about the issues that paramedics face during their work. This can therefore help make insights about how these issues may present themselves in the future.

While the research literature overall suggests that the work stress that paramedic's face have changed little over the last twenty years, the grey literature suggests that their working conditions have become more stressful over the past ten years in the UK (see Chapter 3). Similar declines in emergency responder working conditions appear to be happening in other countries. Notably a recent Canadian documentary highlighted the relatively high incidence of paramedic suicides in Canada in 2016 (Eastwood & James, 2018). During this year, 56 per 100,000 paramedics died of suicide (Eastwood & James, 2018). So far, there are no reports of suicide rates as high as this in the UK. However, the online poll by Mind (2016b) suggests that one in four emergency service workers in the UK have contemplated suicide. Additionally, an investigation by Hird et al. (2019) using data from the Office for National Statistics suggested that between 2011 and 2015, there were 20 suicide deaths amongst paramedics in England. They identified the risk of suicide in male paramedics was 75% higher than the national average. Further research is needed, but the development of mental health strategies and risk identification are required (Hird et al., 2019).

The grey literature possesses the advantage of up-to-date reporting, but this also contains potential issues with accuracy and political influences. Journalistic and empirical research is therefore needed to help investigate these apparent issues with an objective and rigorous approach. For instance, the tendency for the media to sometimes exaggerate their stories (Ready, White & Fisher, 2008) could mean that the current difficult work conditions of paramedics may represent a transition period wherein it would take time for structural changes to become more beneficial, as opposed to a near permanent decline of their quality of job satisfaction. At the present, it nevertheless appears that measures need to be taken to help ensure that these reported problems improve or at the very least do not worsen.

Issues such as these are being recognised in workforces across the UK as well as the ambulance service. An independent review by Stevenson & Farmer (2017) obtained data on the effect of mental ill health on employment across the UK, and developed proposals to help alleviate issues. Their review suggested that 300,000 individuals lose their job each year due to a long-term mental health problem. This is estimated to cost employers between £33-42 billion, and government sectors £24-27 billion. Recommended measures to curb these issues involve both structural and cultural changes. Cultural changes include raising mental health awareness, while structural changes include improving working conditions, increasing access to timely help and routinely monitoring employee mental health. Application of these commitments to paramedics can potentially be made as well. These ought to complement any positive impact of digital resilience promoting resources.

The 2019 UNISON Health Care Service Group Annual Conference proposes actions to be taken to reduce burnout and mental health issues in the NHS, including members of the ambulance service. Similarly, this advocates cultural changes. These

include increasing awareness of mental health and ending bullying cultures in the health service. This also advocates structural changes, such as improving unions to make health care provider's voices heard better on this issue and allowing ambulances to use bus lanes to improve access to patient care and reduce paramedic stress levels. There are also calls to reduce the paramedic retirement age from 67 to 60, likewise to other blue light service workers.

Therefore, it seems that encouraging plans are being taken to improve the working conditions of paramedics that may help improve wellbeing. Progress will need to be monitored to ensure that these proposals are implemented, and they are successful in their aims. There are also potential issues specific to paramedics with these proposals that will need to be monitored. Firstly, the proposals by Stevenson & Farmer (2017) and UNISON (2019) suggest that increasing awareness of mental ill health will help reduce stigma. However, the manner in which this is done may differ in effectiveness between paramedics and other health sectors due to the factor of masculinity. The paramedic workforce possesses a form of work-culture masculinity that sometimes perpetuates stigma towards mental health issues even when awareness is increased (Haugen et al., 2017; Quaile, 2016). Considerations need to be made to ensure that the increase in mental health awareness does not inadvertently amplify the apparent bullying culture in some areas. The online forum research suggested that biological explanations of mental distress can potentially be one way to successfully reduce stigma. The review by Stevenson & Farmer (2017) emphasise the importance of workplace leaders who understand and respect mental health issues. Applying this to paramedics may additionally be helpful.

Secondly, while these measures may help, it cannot be concluded whether they will alleviate the damage caused by the structural changes made over the last ten years

to save costs. For example, while allowing ambulances to use bus lanes represent a step in the right direction, it is unlikely that it would for instance counterbalance the effect of the closure of smaller local ambulance stations that result in greater transport times and working hours (BBC, 2012; Hirst, 2017). Overall, the detriment to the mental health of paramedics due to the austerity measures described in Chapter 3, Section 3.4 may not be alleviated entirely by the strategies currently proposed. This point is more pressing considering that the ambulance service ideally needs to fill the 1000 vacant posts across the UK ambulance service (Campbell, 2018) as well as improving the wellbeing of the current workers.

And thirdly, the measures proposed by Stevenson & Farmer (2017) and UNISON (2019) may help improve the external resilience of paramedics. This is likely to improve their wellbeing. According to the proposed hypothesis in Chapter 10, this may specifically improve their protection from chronic trauma. If this hypothesis is proven to possess validity, then the proposed measures may not have a profound effect on the acute work trauma that paramedic's experience, which is mediated by internal resilience according to the hypothesis.

Digital programs and interventions are therefore one potential way to help improve the internal resilience of paramedics. The increasing use of digital technologies in mental health treatment is a proposed aspect of the NHS Five Year Forward View (NHS, 2014). While the proposed plans were aimed mostly at patient care, the application of this to paramedics for their own mental health would be a sensible approach (Dodd, 2017). As well as providing mental health treatment, using digital technologies for psychological resilience such as the STDRT could potentially play a role in the future of paramedic well-being, should further research support its effectiveness.

The feasibility study suggests that the STDRT could be helpful in improving psychological resilience. However, it may not be capable of alleviating the chronic work stresses that are amplified by structural changes caused by policies of austerity. Future research needs to evaluate the extent to which DPFPSH can counterbalance the negative effects of structural changes in paramedics. Digital technologies can however provide other means of support beyond psychological resilience training. The online forum study conducted as part of the current PhD project highlighted how paramedics can use these online forums to anonymously discuss critical incidents, chronic stressors and receive advice from other paramedic or related emergency service workers. Furthermore, this can be done outside of working hours. The extent to which engaging with these forums improves mental wellbeing is currently unknown, but it may be possible that they can help replace the beneficial aspects of socialising in the paramedic workstations that has been declining due to an increasing work schedule (Mildenhall, 2012b). The online forum study suggested that most users were from the US, and substantially less forum threads were dedicated to discussing mental health issues compared to other topics. Future research in this area is needed. This would be especially beneficial, as both mental health awareness and globalisation of internet use are increasing (Naslund, Aschbrenner, Marsartels, & Bartels, 2016). This would most likely mean that online forums such as those researched in this thesis would contain more information about mental health in a given workforce from a wider range of different countries and cultures.

As well as digital technologies, TIA may be increasingly used in relation to paramedics and mental health. As outlined in Chapter 10, Section 10.5.1, TIA provides an alternative to medical models of psychopathology with an emphasis on the personal experiences that manifest into mental distress, and suggests that providing a safe haven for trauma recovery is important. TIA is being increasingly applied to a number of

different populations (Wilson, Fauci & Goodman, 2015). As most of the mental distress that paramedics experience appears to derive from their traumatic work experiences, TIA could be applied to paramedics in the future. However, despite their well-documented issues, medical models will not go away suddenly, especially if paramedics prefer medical approaches. Rather, medical models will continue to revise themselves in order to better explain and diagnose what research and political influences suggest being the correct criteria. The recent DSM-5 and ICD-11 have made steps to include chronic trauma and negative symptoms in their criteria for PTSD, which appears to be an improvement in terms of representing the trauma and symptomology of paramedics. Research using these medical models in the future can improve by devising psychometric measures that sufficiently reflect chronic work trauma and negative PTSD.

11.5 Epilogue

The aim of this project was to conduct a feasibility study for a digital program designed to increase resilience in paramedics. However, over the course of the program more questions were raised that I endeavoured to answer. These include the definition of resilience, the aetiology of PTSD, how it affects paramedics and what more can be done to help. While most of these questions are too complex to provide definitive answers, I aimed to explain the different theories and perspectives as fully as possible. I also aimed to further knowledge in this area with both the online forum study and the feasibility study. While many of the issues highlighted are urgently pressing, further research is still needed to fully understand the best ways to help paramedics who undergo tremendously difficult experiences in order to provide the best emergency care they can for people urgently requiring their specialist support.

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Appendices

Appendix 1: Participant Information Sheet for the Self-Taught Digital Resilience Training Version 1 Feedback Study with Nwas

Information Sheet, Focus Group, Version 1, 28/09/16



University of Central Lancashire

Preston PR1 2HE
United Kingdom

Tel: +44(0) 1772 201201

Participant Information Sheet.

Study title: Feedback on a self-taught digital cognitive resilience program.

You are being invited to take part in a focus group as part of a student's PhD research project at UCLan School of Health Sciences. Before you decide whether or not to take part, it is important for you to understand why the research is being done and what it will involve. Please take your time to read the following information carefully.

Background to the study.

Recent research suggests that there is a problematic issue of paramedic workers suffering from occupational trauma as a result of the experiences they undergo in their profession. For instance, one recent study suggested that 94% of paramedic workers had directly experienced at least one traumatic event, and 16% met the diagnosis criteria for post-traumatic stress disorder (PTSD) (Fjeldheim et al., 2014). Interventions such as cognitive behavioural therapy (CBT) are available for paramedic workers if they do demonstrate trauma-related symptoms. However, there has been little focus of aiming to prevent psychiatric disorders from occurring in this vulnerable population in the first place.

The research project therefore aims to develop a digital program designed to deliver information providing paramedic workers with self-teach cognitive resilience. Cognitive resilience can be described as the ability to maintain mental health, despite exposure to stressors. Previous research suggests that factors contributing to cognitive resilience include optimism, sense of meaning and empathy. The idea of cognitive resilience training is to train individuals to learn and embody these factors in order to make them less susceptible to psychiatric disorders in the future.

Why am I being asked to take part?

You are being invited to take part in this research because you are a paramedic with first-hand experience in this particular area. Your role, should you choose to participate, would be to provide feedback on a digital program created by the researcher, designed to provide self-taught

resilience training to paramedics. Your input would help to improve the digital program by commenting on its efficacy and perceived effectiveness.

What would be required of me?

Should you chose to take part in the study you will be given a copy of the digital program prototype. You will be given some basic instructions on how to use it, and left to use and experiment with it in your own time. Once you have had a look at most or all of the features, you may then complete the feedback sheet. This allows you to rate aspects of the program on a five-point scale, as well as write sentences relating to this. You can then email the feedback sheet back to the researcher. At a later date, the researcher will send you an updated version of the digital program, and another feedback sheet. You may then provide feedback on the updated version, and send this to the researcher.

Ethics and Further Information.

Thank you for considering participation in this study. Please read this sheet and the consent form. If you would like to participate, please sign the consent form and email it to the researcher at KBaqai@uclan.ac.uk. You can withdraw from the study at any point up until you have sent the feedback sheet to the researcher.

All your data will be stored safely at UCLan and only be seen by the researcher and supervisors. Any data collected during this study will be kept confidential and only used for research purposes. All published quotations will be anonymous. The results from this study may be published in scientific journals or presented at conferences or seminars. All data in published documentation will be anonymised.

There are no otherwise adverse risks of taking part in this study. Ethical approval was obtained on 28 March 2017.

Researcher: Kamran Baqai, School of Health Sciences, University of Central Lancashire, Preston, PR1 2HE.

Email: KBaqai@uclan.ac.uk

If you wish to contact an independent person at UCLan about this research with any concerns or complaints, you can use the below contact:

Supervisor: Mick McKeown, School of Health Sciences, University of Central Lancashire, Preston, PR1 2HE.

Email: MMckeown@uclan.ac.uk

Additionally any complaints as well as ethical concerns can also be address by contacting Emma Sandon-Hesketh, the university Officer for Ethics, via email: officerforethics@uclan.ac.uk.

Appendix 2: Participant Consent Form for the Self-Taught Digital Resilience Training Version 1 Feedback Study with NWS

Consent Form, Feasibility Study, Version 3, 26/02/18



Participant Consent Form

Resilience over Recovery: A Feasibility Study on a Self-Taught Resilience Program for Paramedics

Kamran Baqai: Researcher, KBaqai@uclan.ac.uk

Mick McKeown: Principle Investigator, MMckeown@uclan.ac.uk

This consent form is part of a student PhD project under the title 'Resilience over Recovery: A Feasibility Study on a Self-Taught Resilience Program for Paramedics.' Please read the following statements and initial the boxes to indicate your agreement, should you wish to participate in this study.

Please Initial Box

I confirm that I have read and understood the information sheet version 3, dated 24/02/18, for the above study and I have had the opportunity to consider the information, ask questions, and have had these answered satisfactorily.

I understand that my participation is entirely voluntary, and the proposed study is not intrinsically linked to my course in any way.

I consent to participate in this study out of my own choice, and have not been overtly influenced by another person.

I understand that I have the right to withdraw from the study prior to the start and I can do so without providing a reason.

I agree to anonymized quotations from my feedback sheet being used in published work.

The researcher has provided me with their contact details as well as the contact details of the primary supervisor.

PTO

I understand that all published data will be anonymized.

I understand that non-anonymized data will be encrypted and secure, and only viewed by the researcher and their supervisors.

I understand that information will be kept confidential unless anything of concern is disclosed, in which case the Head of School (or other appropriate person) will be informed.

I agree to participate in this study.

Name of Participant

Signature

Date

Name of Researcher

Signature

Date

If signed, a copy of this consent form will then be given to you to keep.

**Appendix 3: Feedback Sheet for the Self-Taught Digital Resilience Training
Version 1 Feedback Study with NWAS**



Feedback Sheet

Gender: Male Female

Age _____

Number of years in paramedic service _____

Current location/region situated _____

Job title _____

What type of device did you view the program on? Portable Computer Both

	I completely agree	I agree	I am not sure	I disagree	I completely disagree
The program was easy to use					
The program ran smoothly with no glitches					
The content in the program was interesting and insightful					
The content in the program has the potential to improve my resilience to occupational stress and trauma					
The tasks in the program were helpful in raising my understanding of occupation trauma, stress and resilience					
I believe that the program would be					

beneficial for paramedics at the start of their career					
I believe that the program would be beneficial for paramedics years into their careers already					

I think the best parts of the program are:

I think the program could improve by:

Any additional opinions and views:

Thank you for taking the time to test the program, as well as complete the questionnaire. The questionnaire can be sent via email to **KBaqai@uclan.ac.uk**.

If you have any issues, then you may contact either the researcher or the principle investigator via email.

Researcher: KBaqai@uclan.ac.uk

Principle Investigator: MMckeown@uclan.ac.uk

Appendix 4: Poster Inviting Participation for the Self-Taught Digital Resilience Training Version 1 Feedback Study with Nwas



Could you take a minute to help?

A research project is being carried out in order to make a digital program that can provide self-taught resilience training. This may help to reduce burnout, stress and occupational trauma in paramedics.

We would appreciate your help in providing feedback on a prototype of a digital program created by researchers at the University of Central Lancashire. Your participation thus only requires experimenting with this digital program, and completing a two page feedback sheet. You are welcome to participate if you have any type of paramedic role of any seniority.

In order to obtain more information as well as participant consent forms, please email KBaqai@uclan.ac.uk



Appendix 5: Template Forum Post Inviting Users to Discuss Occupational Trauma and PTSD

Initial Post by Researcher

Dear Users,

I am currently a PhD student researching trauma and PTSD in paramedics, and ways in which we can use prior psychological training to help reduce this beforehand rather than trying to catch up afterwards with traditional therapy. The title of the study is “Self-taught cognitive resilience in paramedic workers: Is prevention as effective as treatment for trauma-related disorders?”

The prior psychological training aims to be cost-effective and time-flexible in order to fit in with the schedules and work demands of paramedics. A prototype of this may be available for forum users here to test.

My intention is to read participant’s posts in this forum, especially in the Mental Health section, in order to gain more first-hand experience of the area. Prior research suggests that the work stress and experience of traumatic events can lead to occupational trauma and secondary mental illness in paramedics. As part of the research I hope to obtain more information on this.

As part of the foundation of my research I am asking any paramedics here for their input, ideas and experiences. Please feel free to talk about anything related to this area, whether it's your own personal experiences with occupational trauma, ideas as to what the psychological training may include or even criticism of the project itself (in qualitative research, any information is useful information). As part of my research I may include posts on this forum thread as qualitative data in the thesis and also in a journal article. All personal data will be kept anonymized, including usernames. Additionally if anyone creates a post and does not want this to be included in analysis or publication could you please let me know by either replying to that post, or privately messaging me through the private message feature within this forum, or by email at KBaqai@uclan.ac.uk. Posts will not be included in the study if users do not make it clear that they consent to allow this.

Appendix 6: Template Forum Message Requesting Permission to Include Forum Post within the Thesis

Request to use Post

Dear *User*,

I am currently a PhD student researching trauma and PTSD in paramedics, and ways in which we can use prior psychological training to help reduce this beforehand rather than trying to catch up afterwards with traditional therapy. Additionally the prior psychological training aims to be cost-effective and time-flexible in order to fit in with the schedules and work demands of paramedics. The title of the study is “Self-taught cognitive resilience in paramedic workers: Is prevention as effective as treatment for trauma-related disorders?”

My intention is to read participant’s posts in this forum in order to gain more first-hand experience of this area. I have read your previous post and have noted that this is relevant and interesting to my current project. Would I be allowed to use this post as part of my research data collection? As well as the information, the post itself may be used as a quote in a research article. All personal data will be kept anonymised, including your username. Could you please let me know by either replying to this post, or privately messaging me through the private message feature within this forum, or by email at KBaqai@uclan.ac.uk.

Appendix 7: Participant Information Sheet for Feasibility Study

Information Sheet, Feasibility Study, Version 3, 24/02/18



Participant Information Sheet.

Study title: Resilience over Recovery: A Feasibility Study on a Self-Taught Resilience Program for Paramedics

Invitation

You are being invited to take part in a feasibility study as part of a research study at UCLan College of Health Sciences. Before you decide whether or not to take part, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully.

Background and purpose of the study.

Recent research studies suggest that there is a problematic issue of paramedic workers suffering from occupational trauma as a result of the experiences they undergo in their profession. For instance, once recent study suggested that 94% of paramedic workers had directly experienced at least one traumatic event, and 16% met the diagnosis criteria for post-traumatic stress disorder (PTSD) (Fjeldheim et al., 2014). Interventions such as cognitive behavioural therapy (CBT) are available for paramedic workers if they do demonstrate trauma-related symptoms. However, there has been little focus of aiming to prevent trauma-related symptoms from occurring in this vulnerable population in the first place.

The research project aims to develop a digital program designed to deliver information providing paramedic workers with self-teach cognitive resilience. Cognitive resilience can be described as the ability to maintain mental health, despite exposure to stressors. Previous research suggests that factors contributing to cognitive resilience include optimism, sense of meaning and empathy. The idea of cognitive resilience training is to train individuals to learn and embody these factors in order to make them less susceptible to trauma-related symptoms in the future. This represents a relatively new area of research, with applications of cognitive resilience training being shown to have success in reducing the onset of occupational trauma in the military (Lester et al., 2011; Reivich et al., 2011), healthcare workers (Craigie et al., 2016;

Zamirinejad et al., 2014) and adolescents in schools (Brunwasser, Gillham, & Kim, 2009; Challen, Machin, & Gillham, 2014). Furthermore, incorporating resilience training techniques into computer devices shows promising results in making resilience training more cost-effective and accessible (Chittaro & Sinoni, 2014; Kuhn et al., 2014; Luik et al., 2016).

Why am I being asked to take part?

You are being invited to take part in this research because you are a paramedic student at UCLan. Your role, should you choose to participate, would be to take part in a feasibility study. The idea of the feasibility study is to test a prototype of the digital program in order to gain information about how well a complete randomised controlled trial would work in the future. This digital program is titled as the self-taught digital resilience training (STDRT).

Do I Have to Take Part?

Participation in this study is voluntary, and not intrinsically linked with your course in any way. Additionally those who choose to participate also have the right to withdraw from the study at any stage. Furthermore, you may request to withdraw any data obtained from you, if it has not already been analysed in the post-study.

What would be required of me?

Part of the preliminary testing of STDRT requires obtaining measures of the participant's mental state before and after using it. Therefore, the first stage of the study will require you, should you consent, to complete three questionnaires designed to measure your traumatology levels, chronic burnout levels, and your resilience levels. These questionnaires are respectively the Davidson Trauma Scale (DTS), the Checklist Individual Strength (CIS) and the Connor-Davidson Resilience Scale (CD-RISC). These can be done either in a booked slot on the university campus, or in your own time via email depending on your preference and availability. The second stage of the study will depend on whether you are allocated at random to the experimental group or the control group. Participants in the experimental group will receive a copy of the STDRT prototype, as well as instructions on how to use it. For a period of six months, they can use this in their own time. The control group will not receive this, and will effectively be inactive during stage 2. In the third and final stage, all participants after a period of six months since the beginning will once again complete the DTS, CIS and the CD-RISC. This phase will mark the end of your participation in the study.

How long will it take to do?

Phase 1 of the study will consist of you completing the 3 questionnaires: the DTS, CD-RISC and the CIS. These will approximately take 10 minutes each to complete, so 30 minutes in total. For the experimental group, the time taken in phase 2 will depend on how you choose to interact with the STDRT. Browsing through all features may take approximately 30 minutes. For your general use throughout the 6 months, you may choose, for instance, to engage with the STDRT 10 minutes per week. Phase 3 once again consists of completing the three questionnaires from phase 1, which should again take 30 minutes.

Who is organising the research?

The research is being carried out as part of a PhD project. The PhD student will be acting as the administrator of the STDRT and the questionnaires. The project is funded by a

university grant, and contact details of the researchers can be found at the bottom of this document.

How do I take part?

If you wish to take part in this research, you will need to sign the consent form, and return to the researcher. This is available digitally, and sent to your email address. This can then be returned to the researcher via email at KBaqai@uclan.ac.uk. Also, the researcher will attend one of your classes. This will give you the opportunity to sign and return the consent form in-person. This information sheet, as well as the consent form, will be handed to all paramedic students in that class on the day. All students will be required to hand back consent forms, signed or unsigned, in order to prevent those who have signed it from being known to others. After this day, the consent form will still be available to return via email for one more week.

Confidentiality.

Any data collected during this study will be kept confidential and anonymous unless anything of concern is disclosed, in which case the Head of School (or other appropriate person) will be informed. Otherwise, data will be stored safely at UCLan and only be seen by the researcher and supervisors. To further ensure confidentiality, the researchers will combine your data with that of many other participants and use this dataset, rather than individual data, for published reports, journals or seminars, or conferences.

Withdrawal from study.

If requested, we will withdraw your data from the study provided that it has not already been analysed. If you want to know anything about your data or want to have your data deleted after you have completed this study, you will need to tell us the participant number the researcher will assign to you. A copy of this number will be given to you at the start of the study.

Further ethics information.

This study aims to investigate sensitive issues, such as occupational trauma. If you would like to talk to someone qualified in this area, yet not involved in this study, you can use the UCLan counselling service. This offers a free, confidential counselling service to all registered UCLan students, which is open throughout the year, except for short periods over the Christmas and Easter breaks. Appointments are available Monday-Friday, from 8:30am-5:30pm. Telephone: 01772892572. Location: Foster Building, 119. Email: CoRecep@uclan.ac.uk.

Ethical approval was obtained on 12/03/18.

Researcher: Kamran Baqai, Faculty of Health and Wellbeing, University of Central Lancashire, Preston, PR1 2HE.

Email: KBaqai@uclan.ac.uk

If you wish to contact an independent person at UCLan about this research with any concerns, you can use the below contact:

Supervisor: Mick McKeown, Faculty of Health and Wellbeing, University of Central Lancashire, Preston, PR1 2HE.

Email: MMckeown@uclan.ac.uk

If you wish to contact an independent person at UCLan about this research with any complaints, you can use the below contact:

Emma Sandon-Hesketh, University Officer for Ethics, Research & Innovation Office, University of Central Lancashire, Preston, PR1 2HE.

Email: officerforethics@uclan.ac.uk.

Appendix 8: Participant Consent Form for Feasibility Study

Consent Form, Feasibility Study, Version 3, 26/02/18



Preston PR1 2HE
United Kingdom

Tel: +44(0) 1772 201201

Participant Consent Form

Resilience over Recovery: A Feasibility Study on a Self-Taught Resilience Program for Paramedics

Kamran Baqai: Researcher, KBaqai@uclan.ac.uk

Mick McKeown: Principle Investigator, MMckeown@uclan.ac.uk

This consent form is part of a student PhD project under the title 'Resilience over Recovery: A Feasibility Study on a Self-Taught Resilience Program for Paramedics.' Please read the following statements and initial the boxes to indicate your agreement, should you wish to participate in this study.

I confirm that I have read and understood the information sheet version 3, dated 24/02/18, for the above study and I have had the opportunity to consider the information, ask questions, and have had these answered satisfactorily.

I understand that my participation is entirely voluntary, and the proposed study is not intrinsically linked to my course in any way.

I consent to participate in this study out of my own choice, and have not been overtly influenced by another person.

I understand that I have the right to withdraw from the study prior to the start and I can do so without providing a reason.

I agree to anonymized quotations from my feedback sheet being used in published work.

The researcher has provided me with their contact details as well as the contact details of the primary supervisor.

I understand that all published data will be anonymized.

I understand that non-anonymized data will be encrypted and secure, and only viewed by the researcher and their supervisors.

I understand that information will be kept confidential unless anything of concern is disclosed, in which case the Head of School (or other appropriate person) will be informed.

I agree to participate in this study.

Name of Participant

Signature

Date

Name of Researcher

Signature

Date

If signed, a copy of this consent form will then be given to you to keep.

Appendix 9: Participant Debrief Sheet for Feasibility Study

Debrief Sheet, Feasibility Study, Version 2, 22/01/18



Participant Debrief Sheet.

Thank you for participating in this study. As outlined in the Information Sheet, the aim of this study was to obtain further information about the functionality and the effectiveness of the prototype STDRT. The aforementioned STDRT is designed to help provide self-taught resilience training to paramedics. *The development of a more complete model later may help reduce rates of trauma symptomology in paramedics.*

Participants are advised to retain a copy of their participant number assigned to them at the beginning of the study. Please feel free to ask the researcher any questions or make comments about the study. If requested the data we have collected from you can be deleted. To reiterate: all data will not be linked to the identity of the participants in any way, and all participants will remain anonymous in both published and non-published works. You may contact the researcher via email (given below) if you wish to learn more information about the study. Background information regarding key areas of the study can be found in the references below:

Gayton, S. D., & Lovell, G. P. (2012). Resilience in ambulance service paramedics and its relationships with well-being and general health. *Traumatology*, 18, 58-64.

Kuhn, E., Greene, C., Hoffman, J., Nguyen, T., Wald, L., Schmidt, J., Ramsey, K. M., & Ruzek, J. (2014). Preliminary evaluation of PTSD coach, a smartphone app for post-traumatic stress symptoms. *Military Medicine*, 179, 12-18.

UNISON (2013). UNISON submission to the NHS working longer review. Available at: <https://www.unison.org.uk/news/article/2013/09/unison-submits-response-to-working-longer-review/>

Researcher: Kamran Baqai, College of Health & Wellbeing, University of Central Lancashire, Preston, PR1 2HE.

Email: KBaqai@uclan.ac.uk

Supervisor: Mick McKeown, College of Health & Wellbeing, University of Central Lancashire, Preston, PR1 2HE.

Email: MMckeown@uclan.ac.uk

Second Supervisor: Karen Wright, College of Health & Wellbeing, University of Central Lancashire, Preston, PR1 2HE.

Email: KMWright1@uclan.ac.uk

If you wish to contact an independent person at UCLan about this research with any concerns or complaints, you can contact the University Officer for Ethics, Emma Sandon-Hesketh.

Email: officerforethics@uclan.ac.uk

Appendix 10: Davidson Trauma Scale used in Feasibility Study

DAVIDSON TRAUMA SCALE

by Jonathan R.T. Davidson, M.D.

Client ID: _____ Age: _____ Sex: Male Female

Date: ____/____/____

Please identify the trauma that is most disturbing to you.

Each of the following questions asks you about a specific symptom. For each question, consider how often in the last week the symptom troubled you and how severe it was. In the two boxes beside each question, write a number from 0 - 4 to indicate the frequency and severity of the symptom.

FREQUENCY	SEVERITY
0 = Not At All	0 = Not At All Distressing
1 = Once Only	1 = Minimally Distressing
2 = 2 - 3 Times	2 = Moderately Distressing
3 = 4 - 6 Times	3 = Markedly Distressing
4 = Every Day	4 = Extremely Distressing

1. Have you ever had painful images, memories, or thoughts of the event?	<input style="width: 30px; height: 20px;" type="text"/>	<input style="width: 30px; height: 20px;" type="text"/>
2. Have you ever had distressing dreams of the event?	<input style="width: 30px; height: 20px;" type="text"/>	<input style="width: 30px; height: 20px;" type="text"/>
3. Have you felt as though the event was recurring? Was it as if you were reliving it?	<input style="width: 30px; height: 20px;" type="text"/>	<input style="width: 30px; height: 20px;" type="text"/>
4. Have you been upset by something that reminded you of the event?	<input style="width: 30px; height: 20px;" type="text"/>	<input style="width: 30px; height: 20px;" type="text"/>
5. Have you been physically upset by reminders of the event? (This includes sweating, trembling, racing heart, shortness of breath, nausea, or diarrhea.)	<input style="width: 30px; height: 20px;" type="text"/>	<input style="width: 30px; height: 20px;" type="text"/>
6. Have you been avoiding any thoughts or feelings about the event?	<input style="width: 30px; height: 20px;" type="text"/>	<input style="width: 30px; height: 20px;" type="text"/>
7. Have you been avoiding doing things or going into situations that remind you of the event?	<input style="width: 30px; height: 20px;" type="text"/>	<input style="width: 30px; height: 20px;" type="text"/>
8. Have you found yourself unable to recall important parts of the event?	<input style="width: 30px; height: 20px;" type="text"/>	<input style="width: 30px; height: 20px;" type="text"/>
9. Have you had difficulty enjoying things?	<input style="width: 30px; height: 20px;" type="text"/>	<input style="width: 30px; height: 20px;" type="text"/>
10. Have you felt distant or cut off from other people?	<input style="width: 30px; height: 20px;" type="text"/>	<input style="width: 30px; height: 20px;" type="text"/>
11. Have you been unable to have sad or loving feelings?	<input style="width: 30px; height: 20px;" type="text"/>	<input style="width: 30px; height: 20px;" type="text"/>
12. Have you found it hard to imagine having a long life span and fulfilling your goals?	<input style="width: 30px; height: 20px;" type="text"/>	<input style="width: 30px; height: 20px;" type="text"/>
13. Have you had trouble falling asleep or staying asleep?	<input style="width: 30px; height: 20px;" type="text"/>	<input style="width: 30px; height: 20px;" type="text"/>
14. Have you been irritable or had outbursts of anger?	<input style="width: 30px; height: 20px;" type="text"/>	<input style="width: 30px; height: 20px;" type="text"/>
15. Have you had difficulty concentrating?	<input style="width: 30px; height: 20px;" type="text"/>	<input style="width: 30px; height: 20px;" type="text"/>
16. Have you felt on edge, been easily distracted, or had to stay "on guard"?	<input style="width: 30px; height: 20px;" type="text"/>	<input style="width: 30px; height: 20px;" type="text"/>
17. Have you been jumpy or easily startled?	<input style="width: 30px; height: 20px;" type="text"/>	<input style="width: 30px; height: 20px;" type="text"/>

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Appendix 11: Checklist Individual Strength used in Feasibility Study

Appendix

***** CIS20R *****
Checklist Individual Strength
 University Hospital Nijmegen
 Department of Medical Psychology

Instruction:

On the next page you find 20 statements. With these statements we wish to get an impression of how you have felt during the past two weeks. For example:

I feel relaxed

If you feel that this statement is not true at all, place a cross in the right box; like this:

I feel relaxed	yes, that is true	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	no, that is not true
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If you feel that this statement is not true at all, place a cross in the right box; like this:

I feel relaxed	yes, that is true	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	no, that is not true
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If you feel that this statement is not "yes, that is true", but also not "no, that is not true", place a cross in the box that is most in accordance with how you have felt.

For example, if you feel relaxed, but not very relaxed, place a cross in one of the boxes close to "yes, that is true": like this:

I feel relaxed	yes, that is true	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	no, that is not true
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Do not skip any statement and place only one cross for each statement.

1. I feel tired	yes, that is true	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	no, that is not true
2. I feel very active	yes, that is true	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	no, that is not true
3. Thinking requires effort	yes, that is true	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	no, that is not true
4. Physically I feel exhausted	yes, that is true	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	no, that is not true
5. I feel like doing all kinds of nice things	yes, that is true	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	no, that is not true
6. I feel fit	yes, that is true	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	no, that is not true
7. I do quite a lot within a day	yes, that is true	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	no, that is not true
8. When I am doing something, I can concentrate quite well	yes, that is true	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	no, that is not true
9. I feel weak	yes, that is true	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	no, that is not true
10. I don't do much during the day	yes, that is true	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	no, that is not true
11. I can concentrate well	yes, that is true	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	no, that is not true
12. I feel rested	yes, that is true	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	no, that is not true
13. I have trouble concentrating	yes, that is true	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	no, that is not true
14. Physically I feel I am in a bad condition	yes, that is true	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	no, that is not true
15. I am full of plans	yes, that is true	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	no, that is not true
16. I get tired very quickly	yes, that is true	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	no, that is not true
17. I have a low output	yes, that is true	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	no, that is not true
18. I feel no desire to do anything	yes, that is true	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	no, that is not true
19. My thoughts easily wander	yes, that is true	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	no, that is not true
20. Physically I feel in a good shape	yes, that is true	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	no, that is not true

SCORING CIS20R

For the items: 2, 5, 6, 7, 8, 11, 12, 15, 20 is the scoring as follows:

yes, that is true	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	no, that is not true
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For the items: 1, 3, 4, 9, 10, 13, 14, 16, 17, 18, 19 is the scoring as follows:

yes, that is true	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	no, that is not true
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Subsequently the four subscales are calculated by summing the respective items

subscale 1: Subjective feeling of fatigue items 1, 4, 6, 9, 12, 14, 16, 20

subscale 2: Concentration items 3, 8, 11, 13, 19

subscale 3: Motivation items 2, 5, 15, 18

subscale 4: Physical activity items 7, 10, 17

Appendix 12: Connor-Davidson Resilience Scale 25 used in Feasibility Study

Connor-Davidson Resilience Scale 25 (CD-RISC-25) ©

*For each item, please mark an "x" in the box below that best indicates how much you agree with the following statements as they apply to you over the last **month**. If a particular situation has not occurred recently, answer according to how you think you would have felt.*

	not true at all (0)	rarely true (1)	sometimes true (2)	often true (3)	true nearly all the time (4)
1. I am able to adapt when changes occur.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. I have at least one close and secure relationship that helps me when I am stressed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. When there are no clear solutions to my problems, sometimes fate or God can help.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. I can deal with whatever comes my way.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Past successes give me confidence in dealing with new challenges and difficulties.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. I try to see the humorous side of things when I am faced with problems.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Having to cope with stress can make me stronger.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. I tend to bounce back after illness, injury, or other hardships.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Good or bad, I believe that most things happen for a reason.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. I give my best effort no matter what the outcome may be.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. I believe I can achieve my goals, even if there are obstacles.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Even when things look hopeless, I don't give up.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. During times of stress/crisis, I know where to turn for help.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Under pressure, I stay focused and think clearly.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. I prefer to take the lead in solving problems rather than letting others make all the decisions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. I am not easily discouraged by failure.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. I think of myself as a strong person when dealing with life's challenges and difficulties.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. I can make unpopular or difficult decisions that affect other people, if it is necessary.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. I am able to handle unpleasant or painful feelings like sadness, fear, and anger.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. In dealing with life's problems, sometimes you have to act on a hunch without knowing why.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. I have a strong sense of purpose in life.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. I feel in control of my life.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. I like challenges.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. I work to attain my goals no matter what roadblocks I encounter along the way.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25. I take pride in my achievements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Add up your score for each column 0 + ____ + ____ + ____ + ____

Add each of the column totals to obtain CD-RISC score = _____

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Appendix 13: Feedback for the Experimental Group used in the Feasibility Study



Feedback Sheet

Participant Number _____

Gender: _____

Age _____

Since you began your course at UCLan, what dates have you been on placement for?

What type of device did you view the program on? Portable Computer
Both

The STDRT (digital program)

	I completely agree	I agree	I am not sure	I disagree	I completely disagree
The program was easy to use					
The program ran smoothly with no glitches					
The content in the program was interesting and insightful					
The content in the program has the potential to improve my resilience to occupational stress and trauma					
The tasks in the program were helpful in raising my understanding of occupation trauma, stress and resilience					
I believe that the program would be					

beneficial for paramedics at the start of their career					
I believe that the program would be beneficial for paramedics years into their careers already					

I think the best parts of the program are:

I think the program could improve by:

Any additional opinions and views:

The CD-RISC Questionnaire

	I completely agree	I agree	I am not sure	I disagree	I completely disagree
The time frame of 'over the last month' was suited to me.					
The questions were easy to understand.					

The questions were related to the type of resilience required to be a paramedic.					
--	--	--	--	--	--

The Davidson Trauma Scale Questionnaire

	I completely agree	I agree	I am not sure	I disagree	I completely disagree
The time frame of 'the last two weeks' was suited to me.					
The questions were easy to understand.					
The questions were related to the type of mental trauma experienced by paramedics.					
The identification of one 'most disturbing' trauma was suitable.					
Being able to identify multiple traumatic incidents would have been helpful.					

The Checklist Individual Strength Questionnaire

	I completely agree	I agree	I am not sure	I disagree	I completely disagree
The time frame of 'the past two weeks' was suited to me.					
The questions were easy to understand.					
The questions were related to the type of fatigue and burnout experienced by paramedics.					

Thank you for taking the time to test the program, as well as complete the questionnaire. The questionnaire can be sent via email to **KBaqai@uclan.ac.uk**.

If you have any issues, then you may contact either the researcher or the principle investigator via email.

Researcher: KBaqai@uclan.ac.uk

Principle Investigator: MMckeown@uclan.ac.uk

Appendix 14: Feedback for the Control Group used in the Feasibility Study



Feedback Sheet

Participant Number _____

Gender: _____

Age _____

Since you began your course at UCLan, what dates have you been on placement for?

The CD-RISC Questionnaire

	I completely agree	I agree	I am not sure	I disagree	I completely disagree
The time frame of 'over the last month' was suited to me.					
The questions were easy to understand.					
The questions were related to the type of resilience required to be a paramedic.					

The Davidson Trauma Scale Questionnaire

	I completely agree	I agree	I am not sure	I disagree	I completely disagree

The time frame of 'the last two weeks' was suited to me.					
The questions were easy to understand.					
The questions were related to the type of mental trauma experienced by paramedics.					
The identification of one 'most disturbing' trauma was suitable.					
Being able to identify multiple traumatic incidents would have been helpful.					

The Checklist Individual Strength Questionnaire

	I completely agree	I agree	I am not sure	I disagree	I completely disagree
The time frame of 'the past two weeks' was suited to me.					
The questions were easy to understand.					
The questions were related to the type of fatigue and burnout experienced by paramedics.					

Thank you for taking the time to test the program, as well as complete the questionnaire. The questionnaire can be sent via email to **KBaqai@uclan.ac.uk**.

If you have any issues, then you may contact either the researcher or the principle investigator via email.

Researcher: KBaqai@uclan.ac.uk

Principle Investigator: MMckeown@uclan.ac.uk

Appendix 15: Self-Taught Digital Resilience Training Guide used in the Feasibility Study

STDRT Guide

Thank you very much for taking part in this study. As a participant in the experimental group, you will be given the Self Taught Digital Resilience Training (STDRT) program to use both throughout the duration of this study, and to keep afterwards if you still wish to use it.

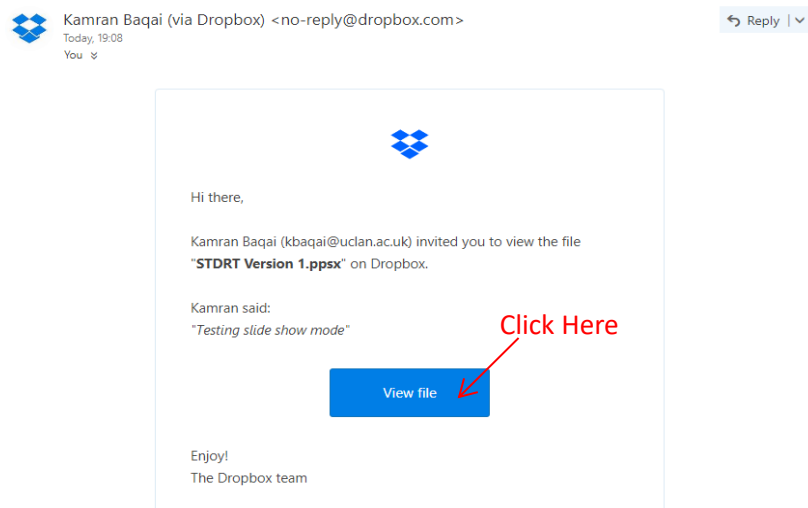
How to obtain the STDRT

After submitting the consent form, you will be asked to complete the complete the three main study questionnaires (see participant information sheet) on UCLan campus in a booked room, or in your own time over the internet. If you complete these questionnaires on campus, you can receive the STDRT by a direct file transfer. If you are taking part in this research mostly online, you can receive it via email and Drop Box, or from the NWAS Learning Zone.

Obtaining the STDRT via Drop Box

If you prefer to take part in this study mostly online, you will receive an email invitation from Kbaqai@uclan.ac.uk open the STDRT via Drop Box. Due to the size of the file, it cannot be send directly via email. If you do not already have a Drop Box account, please set one up here: https://www.dropbox.com/en_GB/

Please keep an eye out for this email invitation. As well as the Focused Inbox, make sure you check the Other Inbox and Junk Email. Once you have received this email, there are a series of basic steps in order to retain the STDRT on your computer/ device. Note: these steps may differ slightly depending on your browser or type of device you are using. The principles should be the same.

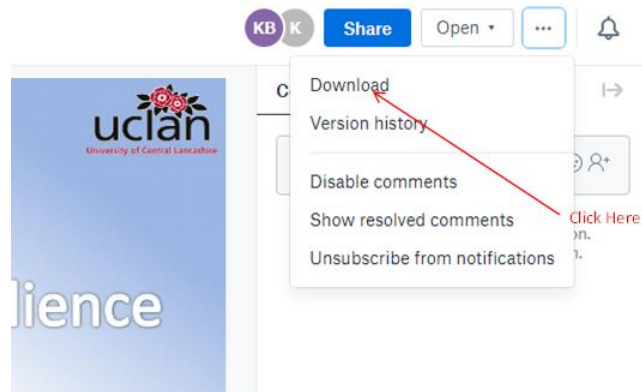


Step 1: Click the 'View file' icon. This should take you to the STDRT via Drop Box.

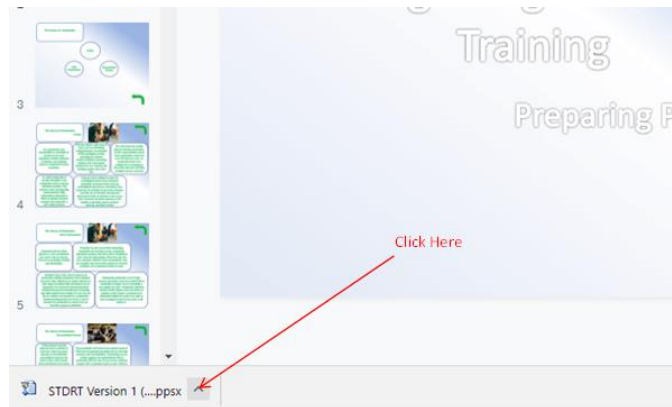
Step 2: Now you will need to get the STDRT onto your computer or device. Click the icon showed in the image below



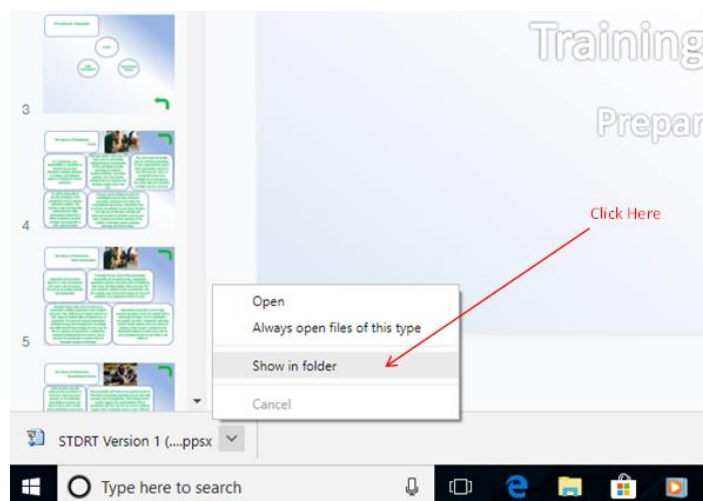
Then Download



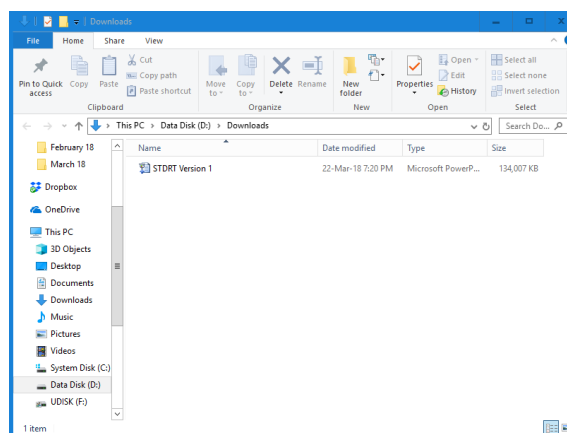
Once the download is complete, select the file options



The Show in folder. This should take you to the folder the STDRT is downloaded in, most likely the Downloads folder.



From here you should be able to copy and paste the file into whichever folder and location you want to.



Obtaining the STDRT via NWAS Learning Zone

If you are registered with the north west ambulance service (NWAS), then you should be able to download the STDRT from their learning zone page. Logon their webpage (<https://www.nwaslearningzone.net/index.php>) and download the file from the link 'Self Taught Digital Resilience Training: Preparing Paramedics'.

NWAS Learning Zone
Online Learning and Information Centre

NHS
North West
Ambulance Service
NHS Trust

Site Home Page
Paramedic Home Page
Newly Qualified Paramedic
Band 6 Paramedic
Pathfinder
Elearning Modules
Equipment User Guides
Clinical Skills Log
PGD Additions and Updates

Paramedic Zone

Welcome to the Paramedic section of the NWAS Learningzone.

NEW
SEPSIS
Information and Pathway

Capacity to Consent and PRF Update

Self Taught Digital Resilience Training: Preparing Paramedics

Paramedic Visual Examination
Screening for visual impairment during call-outs to suspected stroke.

Informational Videos

We now have a selection of 5 video elearning modules provided by the University of Liverpool. These modules are provided for information only and can be viewed by anyone interested.

You will require sound on the computer you are using.

The modules do not produce a completion certificate in the same way that other elearning modules on the site do as they are not written specifically for this system but if you do want a CPD certificate, having viewed the modules, you can obtain one from the MyCPD section on the learningzone home page.

eLearning Denise Prescott - From Individuals to Teams

eLearning Denise Prescott - The NHS, From Policy to Practice

eLearning Mike Rowe - Governance and Agency

eLearning Mike Rowe - Leadership and Management

Using the STDRT

Upon opening the file, it should play immediately.



After several seconds, you will move to the main homepage.





While running on Microsoft PowerPoint, the STDRT runs similarly to a flash program. Throughout the program, you will be able to click on links to take you to other pages. Using the main homepage as an example, clicking on the left bubble will open up background information on the nature of paramedics. Clicking on the multiple bubbles on the right will open up further links to information about occupational trauma, PTSD and mental resilience.

General Information

As part of the ongoing study, you are asked to engage with the STDRT for a period of 6 months. How you use it within this time is up to you. Browsing through all the features at once may take around 30 minutes. For your general use throughout the 6 months, you may choose, for instance, to engage with the STDRT 10 minutes per week.

Additionally you may find the following information useful:

- To exit the program, press Esc if using a computer or device with an external keyboard. If using a portable device, you should be able to exit the program by pressing the U-turn arrow or back arrow.
- To return to previous pages, press the  icon when available. To return to the home page, press the  icon.
- Transitions to other pages can only be done by clicking links, and should not transition by time. On a keyboard, you can press 'N' to move forward or make animations finish faster, and 'P' to go backwards and reset animations. This may however affect the order of page transitions.
- You can write in free-form and highlights parts of pages, if using a computer with a mouse. To do so, right click, select 'pointer options', and select 'pen' or 'highlighter'. You can use the arrow again using the same method. When exiting the program, you will be asked if you want to permanently keep or discard any annotations you have made.
- As well as information, the program will contain tasks designed to help facilitate an aspect of resilience. Some of these tasks may require pen and paper to complete fully.
- Some information and tasks may contain links to external websites. Depending, these may not always successfully work. The web address is also placed besides the link to allow you to access the page manually.
- The information in this program is based on research and external sources, referenced within the program. However, the STDRT taken as a whole is still in the experimental stage. If you have any questions or concerns, you are welcome to enquire the researchers at KBaqai@uclan.ac.uk, or any of the contacts given in the participant information sheet.

Appendix 16: Literature referring to occupational trauma and PTSD, cognitive resilience and digital programs.

References	Aim of Research	Location	Participants	Methods	Results	Conclusions
Occupational Trauma and PTSD						
Alexander, D.A., & Klein, S. (2001). Ambulance personnel and critical incidents: Impact of accident and emergency work on mental health and emotional well-being. <i>British Journal of Psychiatry</i> , 178, 76-81.	To use questionnaires in order to measure the prevalence of psychopathology among paramedic personnel as well as its relationship to personality and exposure to critical incidents.	Scottish Ambulance Service & University of Aberdeen.	160 emergency paramedic workers for a Scottish regional ambulance service.	A number of different questionnaires were used in order to measure psychopathology and personality influences. The questionnaires measures: general psychopathology (GHQ-28), the frequency of the self-reported trauma symptoms (IES), burnout (MBI),	Around one third of participants reported high levels of general psychopathology, burnout and PTSD symptoms. Burnout was associated with lower job satisfaction, longer time in service, less recovery between incidents, and more frequent exposure to incidents. Burnout and	Accident and emergency work has a profound effect on the mental health and well-being of a large portion of paramedic workers. These workers require more personal support and pre-trauma training.

				hardiness (Hardiness Scale, HS), satisfaction (Job Satisfaction sub-scale, JSs). Another questionnaire measured experience in job and most traumatic single incident experienced.	high GHQ-28 score were more likely to be found in those who experienced a disturbing incident within the past six months. Concerns about confidentiality and career prospects deterred staff from seeking personal help.	
Dodd, G. (2017). PTSD, available support and development of services in the UK Ambulance Service. <i>Journal of Paramedic Practice</i> , 9(6), 258-263.	To outline the prevalence of PTSD in UK paramedics, as well as current and potentially future support for this.	N/A. Literature review.	UK paramedics (from different studies across the literature review).	The previous research and reports were reviewed to outline the prevalence, symptoms and causal factors of PTSD in paramedics. This was done through a search of different	The prevalence of PTSD is greater in paramedics than the general population. While no figures were given for PTSD itself, the literature review reported that:	Improvements need to be made for the wellbeing of paramedics in the UK. This needs to be seen as an investment rather than an expense.

				journal databases.	63% of emergency service workers considered leaving their job due to work stress, 27% had contemplated suicide, and 62% of front line staff received treatment for a specific mental health problem during their working life. Also, paramedics had a sickness absence figure of 6.78% (the highest of any NHS staff), and this rose by 28% from 2012 to 2014. Support is being made available from mental health	
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					charities and ambulance service led initiatives (such as peer support programs). Future support may come from digital programs and NHS structural changes.	
Haugen, P. T., McCrillis, A. M., Smid, G. E., & Nijdam, M. J. (2017). Mental health stigma and barriers to mental health care for first responders: A systematic review and meta-analysis. <i>Journal of psychiatric research</i> , 94, 218-229.	To examine the literature and investigate the impact of stigma on the capability of first responders to seek mental health care.	N/A. Literature review	Emergency first responders, such as paramedics, police officers and fire-fighters and search-and-rescue personnel.	The researchers searched the literature database, and included 14 studies on this subject.	Common barriers prevention first responders from accessing mental health care include difficulty scheduling an appointment due to work schedules, not knowing where to get help, difficulty getting time off, work leaders discouraging	Structural recommendations to improve these issues include: Offering psychiatric assessments/mental health care in more discreet general health care settings instead of distinct mental health care sites, making assessments and care routine rather than based on symptoms in

					mental health treatment, fear of services not being confidential, fear that mental health help would have a negative impact on their career, and fear of judgement from co-workers and work leaders. Overall, 33.1% of first responders experienced work stigma, and 9.3% experience barriers to mental health care.	the form of annual monitoring exams, offering assessment and feedback based on bio-behavioural metrics of PTSD symptoms, offering online help and digital applications, and relying on medical models of psychopathology to mitigate stigma and self-blame.
Kirby, R., Shakespeare-Finch, J., & Palk, G. (2011). Adaptive and maladaptive coping strategies predict post-trauma outcomes in ambulance personnel. <i>Traumatology</i> , 17, 25-50.	To explore the adaptive and maladaptive coping strategies in relation to occupational	Queensland University of Technology	125 operational paramedics from various positions and geographical	Participants responded to 3 questionnaires: Post-traumatic Growth Inventory	Greater traumatic events (e.g. involving children, multiple	Study explores in depth the specific adaptive and maladaptive coping strategies associated with

	trauma in ambulance staff.		locations in order to obtain representativeness. Participants had experienced at least one traumatic event.	(positive changes after overcoming traumatic event) and Impact of Events Scale-Revised (negative symptoms associated with disasters). They also completed qualitative questionnaires relating to one of their previously experienced traumatic events.	victims, threat to own life, identifying with victims) produced higher maladaptive coping. Extensive injuries with no personal, external factors produced lower levels of post-traumatic growth and impact of events scores, and the highest for adaptive coping strategies.	positive and negative trauma symptoms. Main relationship is that adaptive coping strategies are associated with promoting specific positive changes after trauma. Conversely maladaptive coping strategies is linked to greater negative symptoms. Positive post-trauma outcome is higher than most people realise and give credit for.
Mildenhall, J. (2012a). Occupational stress, paramedic informal coping strategies: a review of the literature. <i>Journal of Paramedic Practice</i> , 4, 318-328.	To conduct a literature review exploring occupational trauma in paramedics and the effects coping strategies and	University of Nottingham	N/A	A literature review was done on research involving coping strategies in paramedics. This produced	Thematic analysis identified the following as key coping strategies: cognitive techniques (such as	Previous research has shown that some of these coping strategies are helpful (such as support and humour) while other may be

	absence of coping strategies.			10 papers. One was a literature review. The rest were independent articles. None were RCTs.	distancing and avoidance), professional reflection, family support, colleague support, supervisor/manager support, humour, storytelling and risky behaviours (such as drugs and alcohol).	helpful in the short-term but are linked to PTSD in the long-term (such as avoidance and alcohol).
Quaile, A. (2016). Ambulance staff contemplate suicide due to stress and poor mental health. <i>Journal of Paramedic Practice</i> , 8(5), 224-226.	To provide an overview of the high levels of work stress and lack of support that appears to result in suicidal contemplation in paramedics.	N/A.	Both paramedic colleagues of the author and other paramedics/emergency first responders from other studies.	Studies about work stress in paramedics were collected into an overall review, alongside interviews with the researcher's own colleagues.	Mental health problems and subsequent suicide contemplation is greater in paramedics than the general population. Factors resulting in this include intense work pressures, traumatic work incidents,	Measures are being put in place by charities and organisational systems to help curb this issue, but more needs to be done.

					stigma and lack of support.	
Regehr, C., Goldberg, G., & Hughes, J. (2002). Exposure to human tragedy, empathy, and trauma in ambulance paramedics. <i>American journal of orthopsychiatry</i> , 72(4), 505-513.	To investigate the factors that lead to higher levels of mental distress in paramedic, specifically via emotional and cognitive empathy.	US.	86 paramedics from a (unnamed) large emergency service organisation in an urban area of the US.	The participants completed several questionnaires relating to their exposure to critical events and levels of distress. Exposure to critical events was measured using an unmanned custom questionnaire, and levels of distress were measured using the Beck Depression Inventory and the Impact of Events Scale. Social support was also measured using the	Paramedics are frequently exposed to critical events. Some may be secondary traumatic events (death of a patient, line-of-duty death, violence against others, death of a child, near-death experiences and multiple casualties) and other may be primary traumatic experiences (violence against self). Mental distress, PTSD and drug use tent to increase after traumatic events.	Paramedics are exposed to an array of traumatic experiences during their work. Trying to suppress their empathy with victims appears to only worsen psychological symptoms in the long-term. Instead, more appropriate cognitive strategies to help regulate emotions and thoughts should be taken. Social support may not be a buffer to critical work incidents. From this study, a thematic model was made to suggest the

				<p>Social Provisions Scale. 18 of the 86 participants also completed qualitative interviews. Therefore, the study used both quantitative and qualitative methods.</p>	<p>After acute critical incidents, cognitive strategies may help, but emotional distancing only makes this worse in the long-term. Furthermore, levels of social support were not associated with symptoms of depression and traumatic stress.</p>	<p>process by which traumatic work events and individual differences may lead to mental distress.</p>
<p>Shepherd, L., & Wild, J. (2014). Cognitive appraisals, objectivity and coping in ambulance workers: a pilot study. <i>Emergency Medicine Journal</i>, 31, 41-44.</p>	<p>Investigate the link between cognitive appraisals, objectivity and coping in ambulance workers.</p>	<p>London Ambulance Service, in collaboration with University of Oxford.</p>	<p>45 ambulance workers (14 women, 31 men) from the London Ambulance Service. Mean age was 37 years.</p>	<p>Participants completed 3 questionnaires relating to PTSD symptoms and depression symptoms. They then completed an unpublished questionnaire designed to</p>	<p>Participants who reported making more positive appraisals during callouts tended to cope better than those with negative appraisals.</p>	<p>A relationship may be observed between cognitive appraisals and objectivity in enhanced coping in ambulance workers attending to difficult callouts. Training in cognitive</p>

				relate to specific incidents in the emergency service. This required them to bring in mind a previous difficult call-out where they coped well and one where they did not.		appraisals may be beneficial for individuals exposed to trauma. However, limitations include memory bias and only two call-outs being used.
UNISON (2013). UNISON submission to the NHS working longer review. Available at: https://www.unison.org.uk/news/article/2013/09/unison-submits-response-to-working-longer-review/ (Accessed 13 May 2016).	Discussed how the Public Service Pensions Act of 2013 will exacerbate problems already experienced by the NHS.	Across the UK	A meta-analysis of various recent studies, as well as research derived from the project itself gathered from different sectors.	A meta-analysis of various studies investigating the negative effects of over-work in NHS employees.	Overall, many NHS members, especially paramedic workers, are susceptible to burn-out and psychiatric disorders due to the negative experiences and lack of support within	Raising the retirement age will have a detrimental impact on the long-term health of many staff members within the NHS. Current workers require more support.

					their workforce.	
Resilience						
Agaibi, C. E., & Wilson, J. P. (2005). Trauma, PTSD, and resilience a review of the literature. <i>Trauma, Violence, & Abuse, 6</i> , 195-216.	To provide a literature review of trauma, PTSD and resilience, and provide an integrated framework of this.	Queen's University, Canada.	N/A	Review articles in the area and looked at the factors associated with resilience before making an integrative model based on this.	The article devises a flow-chart mode beginning with Traumatic Life Events, then is dependent on personality characteristics, followed by an a x b x c x d x e interaction with allostatic stress responses (such as ego defences). This is then facilitated through continuum of adaptation and resilience, and normal range of coping.	A person x situation interaction model can map out the factors in trauma onset. However, there is a lack of universal agreement of what resilience is, hindering the validity of this model.

<p>Austin, C. L., Pathak, M., & Thompson, S. (2018). Secondary traumatic stress and resilience among EMS. <i>Journal of Paramedic Practice</i>, 10(6), 240-247.</p>	<p>To investigate the positive and negative responses resulting from secondary traumatic stress in paramedics and emergency medical technicians (EMT).</p>	<p>Ambulance centres within the US</p>	<p>EMTs and paramedics from the US.</p>	<p>Participants anonymously completed the Brief Resilience Scale, Post-traumatic Growth Inventory, Secondary Traumatic Stress Scale and the Changes in Outlook Questionnaire-Short. The relationship between these were examined.</p>	<p>Participants overall reported relatively high scores for positive change in outlook. Resilience was negatively correlated to secondary traumatic stress and negative change in outlook. Part-time paramedics and EMT showed significantly greater resilience scores than those working full-time.</p>	<p>Resilience may predict protection for secondary traumatic stress, but resilience may reduce over time and repeated exposure to secondary trauma. More research is needed to explore paramedics' coping mechanisms and resilience factors.</p>
<p>Brunwasser, S. M., Gillham, J. E., & Kim, E. S. (2009). A meta-analytic review of the Penn Resiliency Program's effect on depressive symptoms. <i>Journal of Consulting and Clinical Psychology</i>, 77, 1042-1054.</p>	<p>To conduct a meta-analysis of studies investigating the effectiveness of the Penn</p>	<p>N/A</p>	<p>Controlled evaluations of 17 PRP studies (N = 2498).</p>	<p>The meta-analysis combines the effect sizes using random effect models</p>	<p>Participants who received PRP reported fewer depressive symptoms at</p>	<p>Resilience training within schools may have beneficial effects, although effects sizes are</p>

	Resiliency Program (PRP).			at post-intervention and two-follow-up assessments.	post-intervention with effect sizes from 0.11-0.21.	modest, results are inconsistent and improvements were largely found in children at high risk of depression as opposed to the general population.
Cacioppo, J.T., Lester, P.B., Thomas, J.L., Adler, A.B., McGurk, D., Chen, H.Y., & Cacioppo, S. (2015). Building social resilience in soldiers: A double dissociative randomized controlled study. <i>Journal of Personality and Social Psychology, 109</i> , 90-105.	To measure the effectiveness of resilience training in the US army with a randomised controlled study.	US Army medical research.	48 army platoons (over 3000 individual participants).	Platoons were randomly assigned to either social resilience training (intervention) or cultural awareness training (active control group).	Multilevel modelling analysis indicated that social resilience training, compared to cultural awareness training, produced small but sig. improvements in social cognition and decreased loneliness. Also cultural awareness training produced	Despite results, no evidence was found for social resilience training to be generalised beyond the training foci. Additional research is needed to determine the long term durability, safety and generalisability of social resilience training.

					greater increases in knowledge about Afghans, and decreased prejudice.	
Challen, A.R., Machin, S.J., & Gillham, J.E. (2014). The UK resilience programme: A school-based universal nonrandomized pragmatic controlled trial. <i>Journal of Consulting and Clinical Psychology, 1</i> , 75-89.	To examine the effectiveness of an 18 hour group CBT designed to reduce depressive symptoms; the Penn resilience program within the UK.	Across mainstream schools in England.	2844 students ages 11-12 across 16 different schools.	The students were assigned to either the UK resilience programme (UKRP) or the control condition (usual school provision), based on their timetables. At baseline, post-intervention and one and two year follow-up stages the participants were given questionnaires to measure their mental state. These were: Children's	Post-intervention: UKRP students reported lower levels of depressive symptoms compared to the control group. However the effect size was small ($d = 0.093$) and the same effect was not found in the one or two year follow-ups. Also there was no significant impact on symptoms of anxiety or behaviour at	While UKRP reduced depressive symptoms more than the control therapy, this difference was not statistically significant. Small effect sizes are common in these types of studies, but the lack of statistical difference means that more effective studies are needed before we can consider programs like PRP to be distributed. *Researchers miss a valuable

				Depression Inventory, Revised Children's Manifest Anxiety Scale, Strengths and Difficulties Questionnaire.	any point. Results further indicated a floor effect, with students possessing low symptoms at baseline not having much room for improvement.	point: they did not get worse, meaning the preventative measure may have worked.
Chan, A.O.M., Chan, Y.H., & Kee, J.P.C. (2012). Improving resistance and resiliency through Crisis Intervention Training. <i>International Journal of Emergency Mental Health, 14</i> , 77-86.	To test the effectiveness of Individual Crisis Intervention and Peer Support (ICISF) after two days.	Yong Loo Lin School of Medicine, Singapore.	902 participants consisting of doctors, nurses and allied health. These completed both the pre- and post- test responses.	Participants completed the two day ICISF training as well as completing a related 5 point Likert scale both before and after the study.	The ICISF training improved reported mental health scores from 50% to 81% and their general cognition showed improvement. For instance, participants were more likely to try and look for something good in a negative situation. Additionally	ICISF training may be useful in reducing trauma-related symptoms. However, long-term effects were not tested, and the resiliency training was not prior to traumatic events.

					frequent exposures to stressful events were reported, with 40% experiencing the death of someone they knew while working.	
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<p>Christopher, S. (2015). An introduction to black humour as a coping mechanism for student paramedics. <i>Journal of paramedic practice</i>, 7(12), 610-617.</p>	<p>To use the previous literature to explain how dark humour, while shocking to those not accustomed to it, can be an important coping mechanism</p>	<p>N/A. Literature review.</p>	<p>N/A. Literature review.</p>	<p>Psychological literature, research on paramedics and historical accounts were collected in order to discuss how black humour can be an important way for paramedics to deal with traumatic events and relieve tension with co-workers.</p>		<p>Black humour in paramedics can be important as a coping mechanism. There are individual differences that facilitate the likelihood of its use such as experience in the job or gender. Black humour is only effective is used appropriately, such as not in front of a victim's family.</p>
<p>Clompus, S.R., & Albarran. J.W. (2015). Exploring the nature of resilience in paramedic practice: A psycho-social study. <i>International Emergency Nursing</i>, 28, 1-7.</p>	<p>To use interviews in order to generate information about resilience in paramedics.</p>	<p>University of West England</p>	<p>7 emergency care practitioners.</p>	<p>The study used Free Association Narrative Interviewing (FANI). This included a</p>	<p>The study produced qualitative data that is divided into 4 themes and 10 sub-themes</p>	<p>The qualitative data shows that despite a vast array of challenges that the paramedics face, a variety of</p>

				<p>biographic interview followed by open-ended questions based on this. Coding and qualitative analysis was conducted on the interviews.</p>	<p>based on the paramedics' experiences. The 4 main themes contributing to resilience were <i>Motivation to become a paramedic, Workload pressures, Coping and resilience, and External support.</i></p>	<p>coping mechanisms are also used to help prevent PTSD and burnout.</p>
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<p>Craigie, M., Slayter, S., Hegney, D., Osseiran-Moisson, R., Gentry, E., Davis, S., Dolan, T., & Rees, C. (2016). A Pilot Evaluation of a Mindful Self-care and Resiliency (MSCR) Intervention for Nurses. <i>Mindfulness</i>, 7, 764-774.</p>	<p>To evaluate the effectiveness and efficacy of a mindfulness-based intervention (mindful self-care and resiliency, MSCR) for reducing compassion fatigue in nurses, as well as improving emotional well-being.</p>	<p>Various nursing and psychology schools within Australian universities.</p>	<p>21 nurses , 42.9% with a dependent person who affected their capacity to work.</p>	<p>The study tested participants before and after an intervention. The intervention was a 12 hour MSCR intervention consisting of compassion fatigue resiliency and introduction to mindfulness. The questionnaires <i>Patient Health Questionnaire-9</i> and <i>Short Screening Scale for DSM-IV PTSD</i> were used to measure related psychiatric symptoms. A number of other questionnaires</p>	<p>45% of participants had high burnout scores pre-test, which was reduced to 15% at both post-test and one-month follow-up. For secondary traumatic stress (STS) this was 20% at pre-test and showed no significant change by follow-up. This may be a floor effect. Compassion satisfaction was also reduced from 35% to 15%.</p>	<p>Significant improvements were found across a number of factors. The results of the one-month follow-up further supports the claim that the benefits persist beyond the initial training period. However, this may not be long enough, and participants were merely trained to respond more favourably to the questionnaire. Additionally nurses had trauma symptoms beforehand meaning resilience wasn't measured, therapy was measured. Also STS, general</p>
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				were used to measure related variables before and after the four week treatment as well as a one-month follow-up.		resilience, harmonious passion and anxiety did not show a significant improvement. This may have been a floor effect or the treatment's lack of effectiveness.
Fjeldheim, C.B., Nöthling, J., Pretorius, K., Basson, M., Ganasen, K., Heneke, R., Cloete, K.J., & Seedat, S. (2014). Trauma exposure, posttraumatic stress disorder and the effect of explanatory variables in paramedic trainees. <i>BMC emergency medicine</i> , 14, 1-7.	To examine risk and resilience factors that potentially contributes to the onset and degree of PTSD	University of Stellenbosch, South Africa.	131 paramedic trainees from a local university.	3 different questionnaires were used to measure trauma exposure, the frequency and	94% of these participants had directly experienced trauma. 16% of these met PTSD criteria.	Efficient, ongoing screening of depressive and PTSD symptomatology is needed for

	symptoms in emergency healthcare workers.			severity of PTSD symptoms, depression, alcoholism, physical health, perceives stress, personal support, and resilience. These variables were compared to each other statistically.	Depression had a rate of 28%, alcohol abuse had a rate of 23%, and chronic perceived stress had a rate of 7%. Low social support was also found.	those in high risk groups so early psychological support can be offered.
Gayton, S. D., & Lovell, G. P. (2012). Resilience in ambulance service paramedics and its relationships with well-being and general health. <i>Traumatology, 18</i> , 58-64.	Assess if time in paramedic service is associated with increased resilience, or if simply the profession of paramedics attracts individuals with high levels of resilience. Also investigates if resilience exhibits a positive relationship with	University of the Sunshine Coast, Maroochydore , Australia.	Total of 219 divided into 4 groups. The participant groups were student, diploma-qualified, qualified paramedic and qualified & ICPs respectively.	Participants completed questionnaires assessing resilience, general health and well-being.	Experienced paramedics displayed significantly higher levels of resilience than paramedic students. Furthermore, that resilience was significantly correlated with general health	Experience is linked with resilience, and resilience is associated with protection of well-being. More research is needed into resilience, and enhancement of resilience in this population may result in benefits such as less burnout,

	general health and well-being among paramedics.				and well-being.	reduction in taxpayer money and better wellbeing for paramedics in question.
Hoorelbeke, K., Marchetti, I., De Schryver, M., & Koster, E. H. (2016). The interplay between cognitive risk and resilience factors in remitted depression: A network analysis. <i>Journal of affective disorders, 195</i> , 96-104.	To develop a network analysis for measuring the interactions between resilience, remitted from depression (RMD) and cognitive control.	Ghent University, Belgium	69 RMD participants.	Participants performed a cognitive control task as well as completing the following questionnaires: The Cognitive Emotion Regulation Questionnaire (CERQ), The Remission from Depression Questionnaire (RDQ) and The Resilience Scale (RS). Computers were then used to generate analysis based on these responses.	The association network revealed that resilience forms a key hub, showing a strong negative association with residual depressive symptomology and working memory complaints: Participants with high resilience scores are likely to report fewer residual depressive symptoms and working memory complaints.	Resilience is important in successfully coping with stressors following remission from depression.

<p>Iacoviello, B. M., & Charney, D. S. (2014). Psychosocial facets of resilience: Implications for preventing post-trauma psychopathology, treating trauma survivors, and enhancing community resilience. <i>European Journal of Psychotraumatology</i>, 5, 10-20.</p>	<p>Use meta-analysis and reviews of previous studies as well as the researchers own interpretations in order to develop a constellation of factors contributing to resilience.</p>	<p>Icahn School of Medicine at Mount Sinai, New York,</p>	<p>No direct participants; gathered data from other studies.</p>	<p>Conducted a meta-analysis of previous studies that have examined the relationship between resilience and the onset of mental illness. Then using this, the researchers drew up a list of factors contributing to resilience and wrote a report on each one.</p>	<p>The psychological factors associated with resilience include optimism, cognitive flexibility, active coping skills, maintaining a supportive social network, attending to one's physical wellbeing and embracing a personal moral compass. These are further discussed within the article.</p>	<p>These factors can be cultivated even before exposure to traumatic events, or they can be targeted in interventions for individuals</p>
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<p>Jackson, A. (2011). Community resilience: what significance does it have for an ambulance service?. <i>Journal of Paramedic Practice</i>, 3(9), 489-495.</p>	<p>To outline the factors of community resilience in the ambulance service.</p>	<p>Scottish Ambulance Service</p>	<p>General literature review, mostly oriented to the Scottish Ambulance service.</p>	<p>The researcher for the Journal of Paramedic Practice based the ideas of community resilience from both a literature review and his own experiences and judgements.</p>	<p>Community resilience is the capacity for a community of people to collectively cope with problems and emergencies. Factors include socio-economic buffers and the individual differences of the members within the community. It is very difficult for external organisations outside of the community to create community resilience. Instead, they are able to support them with public services.</p>	<p>In order to improve the wellbeing of paramedics, they have to be able to perform their job to their best capability. This requires public services to improve their facilities so they can do this. This should in turn allow them to provide better care, which improves the resilience of other communities, such as the more remote areas where access to emergency care may take longer to receive.</p>
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					Public services can specifically support the community resilience of paramedics by helping to improve the conditions to make them able to perform their jobs better, as well as closer social ties to the external community.	
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<p>Kleim, B., & Westphal, M. (2011). Mental health in first responders: A review and recommendation for prevention and intervention strategies. <i>Traumatology</i>, 17(4), 17-24.</p>	<p>To collect related literature on the factors that determine mental distress after traumatic work experiences in emergency first responders.</p>	<p>N/A. Literature review.</p>	<p>Emergency first responders, including paramedics, police officers, fire-fighters, and other emergency medical personnel.</p>	<p>A literature search was conducted on how intense work stress and critical incidents contribute to mental distress in emergency workers. 11 key studies were examined.</p>	<p>A range of factors were associated with vulnerability to developing PTSD after critical work incidents and work stress. In general, stronger internal and external resilience was associated with lower PTSD, and social support was perhaps the best protector.</p>	<p>The factors found in this review can be used by research to help implement prevention and intervention strategies.</p>
<p>Lee, J. S., Ahn, Y. S., Jeong, K. S., Chae, J. H., & Choi, K. S. (2014). Resilience buffers the impact of traumatic events on the development of PTSD symptoms in firefighters. <i>Journal of affective disorders</i>, 162, 128-133.</p>	<p>To investigate the mediating factors between traumatic stress and PTSD in firefighters.</p>	<p>Republic of Korea, across four different universities.</p>	<p>552 Korean firefighters.</p>	<p>The participants completed self-report questionnaires to measure traumatic</p>	<p>Traumatic experiences had a direct impact of the onset of PTSD symptoms, as well as an</p>	<p>In general, high levels of perceived stress are linked to depressive symptoms. Occupational</p>

				events, perceived stress, occupational stress, resilience and impact of events.	indirect effect mediated by perceived stress. Additionally firefighters with higher resilience scores had lower trauma scores, both from the direct route and indirect route, compared to those with lower levels of resilience.	stress was not shown to be a mediating variable. Greater levels of traumatic events in this sample lead to higher levels of work-related stress, but not necessarily lead to development of PTSD symptoms. Suggests that PTSD symptoms are influenced by one's perception of global stress instead of specific levels of stress. Interventions may be conducted to target perceived stress, and how one cognitively processes it.
Lester, P. B., McBride, S., Bliese, P. D., & Adler, A. B. (2011). Bringing science to	To discuss whether an	University of Chicago and	NA	Article provides a	Longitudinal research is	The longitudinal research may

<p>bear: An empirical assessment of the comprehensive soldier fitness program. <i>American Psychologist</i>, 66, 77-81.</p>	<p>empirical investigation into the CSF is practical.</p>	<p>Walter Reed Army Institute of Research.</p>		<p>detailed discussion of how feasible an investigation into the CSF is.</p>	<p>currently in progress in partnership with other researchers. These aim to examine the link between physiological, neurological and psychological resilience factors. There should be no ethical issues with regards to a control group, as there is a long waiting list anyway. The assessment tools (such as the GAT+) appear to be reasonably valid.</p>	<p>provide empirical measures of the long-term effectiveness of the CSF.</p>
<p>Luyten, L., Boddez, Y., & Hermans, D. (2015). Positive appraisal style: The mental immune system? <i>Behavioural and Brain Sciences</i>, 38, 112-116</p>	<p>To advocate for mental illness to approach a theology similar to biological</p>	<p>KU Leuven, Belgium.</p>	<p>No participants; article is a theoretical commentary.</p>	<p>NA</p>	<p>Researchers argue that mental illness can be seen as an analogue of</p>	<p>The researchers point out that there may be currently too much emphasis</p>

	pathology, with ideas relating to pathophysiology and immunology.				physical illness, in that mental resilience can help to prevent the onset of psychiatric disorders. This, like medicine and the immune system, should go hand-in-hand with mental therapy.	on treating mental illness and not enough on aiming to prevent it in the first place. Resilience may be viewed as a 'mental vaccine.'
McEwen, B. S., Gray, J. D., & Nasca, C. (2015). Recognizing resilience: Learning from the effects of stress on the brain. <i>Neurobiology of Stress, 1</i> , 1-11.	Article provides a literature review and compilation to discuss the interactions between biological/neurological factors and environmental factors in promoting mental resilience.	The Rockefeller University, New York.	No participants; article is a literature review.	NA	Article outlines the biological changes caused by stress as well as long term positive outcomes in the face of adversity. For instance, the hippocampus is smaller in individuals who have suffered from	The flexibility of the brain is an important consideration with regards to resilience. Brain structure continues to show plasticity throughout adult life, and studies of gene expression and epigenetic regulation reveal a dynamic and

					<p>chronic stress. There are also a number of gender differences with regards to reactions to stress. Adverse effects tend to be temporary, but even more permanent effects can be reversed with therapies involving physical and social integration.</p>	<p>ever-changing brain. Ongoing research is identifying those biological changes that underlie flexible adaptability. Reactivation of plasticity with therapies using both physical and social activity is important. Gender differences are also important.</p>
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<p>Mildenhall, J. (2012b). Cup of tea and a chat? Get the kettle on... <i>Journal of Paramedic Practice</i>, 4(4), 191-191.</p>	<p>To use previous literature and the experiences of the author to evaluate how the demands to meet government targets in the ambulance service is resulting in the decline of talking to other paramedics as a coping mechanism.</p>	<p>N/A. Literature review.</p>	<p>N/A. Literature review.</p>	<p>Psychological literature and research of paramedics, as well as the authors own experiences, were outlined to discuss the importance of talking to other co-workers in paramedics. This is important for coping with stressful work events. Additionally, the increasing emphasis on meeting governmental targets means that the capacity to do this is declining.</p>	<p>N/A.</p>	<p>More research and structural changes is required to address these issues without taking approaches that would further stigmatise paramedics.</p>
<p>Ogińska-Bulik, N., & Kobylarczyk, M. (2015). Relation between resiliency and post-traumatic growth in a group of paramedics: The mediating role of coping strategies.</p>	<p>To investigate the mediating role of coping strategies for stress with</p>	<p>University of Lodz, Poland.</p>	<p>80 paramedics who have experienced</p>	<p>Participants were asked to complete the Post-traumatic</p>	<p>The results show correlations from each</p>	<p>Avoidance and negative expressions hinder post-</p>

<p><i>International journal of occupational medicine and environmental health, 28, 707-719.</i></p>	<p>regards to resilience and recovery from trauma in paramedics. Essentially the study explores if there is a relationship between resilience (helps prevent PTSD) and post-trauma growth (positive changes once recovered from PTSD).</p>		<p>a traumatic event.</p>	<p>Growth Inventory (PTGI), the Resiliency Assessment Scale (SPP-25) and the Inventory to Measure Coping Strategies with Stress – Mini-Cope. These were then correlated with bootstrapping in order to investigate the correlations and the mediating relationships between the three measured variables (positive changes after trauma, resilience and coping strategies)</p>	<p>question on the questionnaires. 46.2% of paramedics reported high levels of post-traumatic growth as a result of coping with traumatic events. These were associated with positive changes. Venting of negative emotions and denial were suppressing variables, in that they hindered the likelihood of positive changes after trauma caused by resilience and coping strategies. Good coping</p>	<p>traumatic growth, while problem-focused strategies and positive emotions facilitate this by mediating with resilience. Resilience also has direct influences on post-traumatic growth as well as the indirect influences.</p>
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					strategies included planning, active coping and positive reframing.	
Reivich, K. J., Seligman, M. E., & McBride, S. (2011). Master resilience training in the US Army. <i>American Psychologist</i> , 66, 25.	Article provides background information regarding the Master Resilience Training Program (MRT) used in the US army.	University of Pennsylvania, Department of the Army	NA	Article outlines the origins of the MRT, which stems from the Penn Resilience Program (PRP) used in schools across the US. The article then discussed in detail what the MRT contains.	Stages of training include: Resilience, Building Mental Toughness, ABC (Action, Belief, Consequence), Explanatory Styles and Thinking Traps, Icebergs (deeply held beliefs),Energy Managements, Minimizing Catastrophic Thinking, Fighting Back Against Counterproductive Thoughts in Real Time, Cultivating Gratitude, Identifying Character Strengths, and Strengthening Relationships.
Sarmány-Schuller, I. (2011). Personality predictors of decision-making of medical rescuers. <i>Studia Psychologica</i> , 53, 175-184.	To evaluate how the decision-making process of paramedics is predicted by personality factors related to emotions.	University of Constantine, Slovakia.	92 paramedics.	Participants played a gambling card game that works on probabilities that was used to measure decision-making.	A linear regression analysis showed that gambling task scores (IGT) could be predicted in the male participants by	There is potentially a profound gender difference in the emotional-related decision making of paramedics. This individual difference may

				<p>Emotional intelligence was measured using a questionnaire (EQ™). Resilience was measured using a Stroop test in order to test for perceptual load. Underlying personality traits was measured using the personality inventory <i>NEO-FFI</i>.</p>	<p>neuroticism, extraversion and time in the Stroop test. This is indicative of rationality, conscientiousness and openness. This approximates to the <i>resistant type</i>. Likewise, the female participants could be predicted by time in Stroop test, emotional awareness and existing conditions. This related to <i>resistant decision making</i>.</p>	<p>be influential in targeted therapies.</p>
<p>Streb, M., Häller, P., & Michael, T. (2014). PTSD in paramedics: Resilience and sense of coherence. <i>Behavioural and cognitive psychotherapy</i>, 42, 452-463.</p>	<p>To examine whether resilience and SOC (as well as other variables) are associated with PTSD</p>	<p>Saarland University, Saarbrücken, Germany</p>	<p>668 paramedics with an average job experience of 10.4 years (<i>SD</i> = 7.2).</p>	<p>The paramedics completed questionnaires measuring resilience, sense of</p>	<p>4.34% of the sample suffered from PTSD and 9.58% from partial PTSD. Years of</p>	<p>SOC was a better predictor than resilience for severity of PTSD symptoms. Indicated that</p>

	severity in paramedics.			coherence (SOC) and PTSD. The sample was cross-sectioned based on their age and experience. Other measures such as gender were taken and measured. These variables were correlated and run through a multiple regression.	service was not associated with PTSD symptom severity. Resilience and SOC accounted for 19.2% of the variance in severity of PTSD symptoms. However, only SOC predicted a significant unique amount of variance in this.	SOC may be more important than previous studies suggest. Lack of influence by age or years of experience suggest that resilience and SOC remain stable over time. However, does not exclude possibility of intervention aimed at increasing resilience and SOC.
Wild, K.V., Smith, K.V., Thompson, E., Béar, F., Lommen, M.J.J., & Ehlers, A. (2016). A prospective study of pre-trauma risk factors for post-traumatic stress disorder and depression. <i>Psychological Medicine</i> , 46, 2571-2583.	To identify the underlying risk factors that may lead to PTSD or major depression (MD) that may be targeted with resilience interventions, and the effect of this after two years.	University of Oxford and Kings College London	453 new paramedics at the London Ambulance Service (LAS).386 of these completed the follow-up interviews.	During the paramedic student's first week of training, a number of different questionnaires were used to measure variables such as trauma exposure,	8.3% of participants developed an episode of PTSD, while 10.6% developed MD. Most of these were short-lived episodes. These participants	Paramedics at risk of developing episodes of PTSD were identifiable within the first week of paramedic training. Resilience interventions should ideally

				<p>anxiety sensitivity, perceived resilience to stress and maladaptive post-trauma cognitions. Every four months for two years the Life Event Checklist (LEC) was used to assess traumatic event history. They also completed an interview after 12 and 24 months, as well as self-report measuring burn-out, days off, weight, insomnia and quality of life.</p>	<p>however reported more days off work, greater insomnia, higher burn-out, lower quality of life and greater weight gain. This indicated that episodes of PTSD and MD are predictors of long-term poorer physical and mental health. Multiple logistics regression analyses also highlighted unique predictors of PTSD episodes, such as rumination, neuroticism and low social support.</p>	<p>target these factors.</p>
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Digital Programs and Self Help						
Chittaro, L., & Sioni, R. (2014). Evaluating mobile apps for breathing training: The effectiveness of visualization. <i>Computers in Human Behavior, 40</i> , 56-63.	To study three designs for breathing training on a digital app and conduct an experiment to	University of Udine	68 undergraduate students from the university as well as	3 app designs were developed. The first (Voice-only) provides	Breathing waveform signal (measure of breathing frequency)	Wave based approaches seem to be the best method of breathing training. This is

	<p>measure the effectiveness of these.</p>		<p>people from other occupations.</p>	<p>instructions through audio only. The second (Sphere) combines the audio with an expanding and shrinking circle. The third (Wave) combines audio with a wave rising and falling. Participants were given questionnaires to measure how effective they believed it was. Biological data was also collected from participants; skin conductance, heart rate, breathing frequency, and breathing power.</p>	<p>was similar among all apps. Wave facilitated greater power (deeper breaths). Sphere also produced deeper breaths compared to voice, but this did not reach significance. Wave was also reported to be better by the participant's questionnaire responses.</p>	<p>most likely due to this method allowing users to keep better track over time of the ideal breathing pattern. Sphere was not too far behind though.</p>
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<p>Hardinge, M., Rutter, H., Velardo, C., Shah, S. A., Williams, V., Tarassenko, L., & Farmer, A. (2015). Using a mobile health application to support self-management in chronic obstructive pulmonary disease: a six-month cohort study. <i>BMC medical informatics and decision making</i>, 15(1), 1.</p>	<p>To test a six-month clinical trial of a mobile app designed to help with chronic obstructive pulmonary disease (COPD).</p>	<p>Variety of hospitals and health care services across England.</p>	<p>18 patients ages between 50 and 85.</p>	<p>The mHealth system was developed on an Android tablet by a team. This provided instructions, such as how to use an inhaler, and graphed out pulse rates using a finger probe that transmitted data via Bluetooth. Data was also sent directly to the NHS researchers. This was then analysed using patient-specific probabilistic models.</p>	<p>5 patients did not complete the study. 3 months after the start of the study 95% of diaries and oxygen saturation measures were completed within 100 s. Patients additionally did not report any difficulty with entering their own data on the app. Video clips on inhaler use were watch a fair number of times.</p>	<p>Regardless of previous experience or age a well-designed mHealth system can be made easy to use. Most patients reported positively on this.</p>
<p>Hayes, Catherine (2018) Building psychological resilience in the paramedic. <i>Journal of Paramedic Practice</i>, 10 (4), 147-152 (Draft version. Available from http://insight.cumbria.ac.uk/id/eprint/3735/1/Hayes_BuildingResilience.pdf)</p>	<p>To outline the potential of Lego Serious Play to facilitate aspects of cognitive resilience</p>	<p>N/A. Literature review.</p>	<p>N/A. Literature review.</p>	<p>The author examined the previous research suggesting that using Lego</p>	<p>N/A.</p>	<p>Creative tasks that help facilitate aspects of internal resilience, such as Lego Serious</p>

				Serious Play is associated with facilitating aspects of cognitive resilience such as decision-making skills, creative reflectivity, emergence, and creative storytelling. The author then outlines how this can apply to paramedics.		Play, may help paramedics. A version of this may be applied into a self-help programme for paramedics.
Kuhn, E., Greene, C., Hoffman, J., Nguyen, T., Wald, L., Schmidt, J., Ramsey, K. M., & Ruzek, J. (2014). Preliminary evaluation of PTSD coach, a smartphone app for post-traumatic stress symptoms. <i>Military Medicine</i> , 179, 12-18.	To how effective a digital app called PTSD Coach is in helping war veterans suffering from PTSD.	VA National Center for PTSD.	45 veterans (34 men and 11 women).	Used a focus group in order to obtain input from 78 veterans with PTSD as part of digital app development. Experimental participants were given the app as well as instructions on how to use it.	Article contains quotes of participants providing qualitative data on how useful they found the app as well as criticisms and recommendations for improvements.	App overall seems to provide beneficial effects for those with PTSD. However, PTSD symptoms were not directly assessed, and long-term severity was not examined.

				They were given 3 days to complete several tasks to ensure that they were exposed to the core features of the app. Participants then met with project staff and completed the post-use survey as well as a focus group with a note-taker.	Almost 90% of the sample reported being moderately to extremely satisfied with the app.	
Luik, A. I., Bostock, S., Chisnall, L., Kyle, S. D., Lidbetter, N., Baldwin, N., & Espie, C. A. (2016). Treating Depression and Anxiety with Digital Cognitive Behavioural Therapy for Insomnia: A Real World NHS Evaluation Using Standardized Outcome Measures. <i>Behavioural and Cognitive Psychotherapy, 1</i> , 1-6.	To evaluate a digital self-help webpage for insomnia, and its ability to also help reduce co-morbid depression and anxiety.	Manchester North, Central and South Clinical Commissioning Groups.	98 patients from Sleep Help Manchester.	Participants were given access to the digital treatment (www.sleepio.com, and the Sleepio App), which contains six sessions, lasting around 20 minutes each, including tasks such as	73% of participants finished the treatment. Those who completed it improved significantly in baseline measurements in depression and anxiety compared to those who didn't	The digital insomnia therapy was beneficial in reducing insomnia, depression and anxiety. Further study needed to test fully if insomnia is a mediator for anxiety and depression.

				keeping a sleeping diary. Questionnaires were used to measure depression, anxiety and insomnia at both baseline and post-treatment.	complete it. Participant's depression and anxiety scores were also significantly reduced between pre-treatment and post-treatment; 58% who scores clinical levels on the anxiety and depression scales moved to recovery. Additionally insomnia symptoms significantly decreased.	Limitations include a lack of control therapy. Fairly high drop-out rate (27%) is also a concern; maybe it's easier to drop out when there's just a screen and not a person to help pull you through it?
McCann, T. V., Songprakun, W., & Stephenson, J. (2016). Efficacy of a self-help manual in increasing resilience in carers of adults with depression in Thailand. <i>International journal of mental health nursing</i> , 25, 62-70.	To examine the efficacy of a cognitive behaviour-therapy guided self-help manual in increasing resilience in caregivers with depression.	Victoria University, Australia.	52 adult primary caregivers with a diagnosis of depression.	An RCT was conducted between an experimental group and a control group. The experimental group received CBT incorporated	While both groups reported improvements, the experimental participants reported a significantly greater increase in	Guided self-help is helpful in improving caregiver's resilience and could be used as an adjunct to the limited support provided to carers.

				with a guided self-help (GSH) manual. The control received standard support. Both sets of participants completed the Resilience Scale (RS) at baseline, post-test and follow-up.	resilience compared to controls.	However, while study measured resilience levels, it did not measure mental health levels. Possible that resilience-treatment participants were just responding more to resilience questions out of conditioning or participant bias.
Wild, J., El-Salahi, S., Tyson, G., Lorenz, H., Pariante, C. M., Danese, A., Tsiachristas, A., Watkins, E., Middleton, B. Blaber, A., & Ehlers, A. (2018). Preventing PTSD, depression and associated health problems in student paramedics: protocol for PREVENT-PTSD, a randomised controlled trial of supported online cognitive training for resilience versus alternative online training and standard practice. <i>BMJ Open: British Medical Journal</i> , 8(12), e022292.	To report the current progress on a study that aims to test the effectiveness of a general cognitive resilience tool, the internet-delivered cognitive training for resilience (iCT-R) in a sample of paramedic students.	Conducted primarily at University of Oxford in collaboration with University of Brighton, Oxford Brookes University, Bournemouth University, University of Hertfordshire, University of Worcester, University of	Paramedic students from collaborating universities. The study is currently in progress, but the researchers hope to obtain a total sample size of 570 participants.	The ongoing study aims to conduct a randomised control trial to test how effective the iCT-R is at increasing resilience and reducing mental distress compared to a control prevention tool (Mind Online). Mental distress	N/A. Study is ongoing.	N/A. Study is ongoing.

		Surrey, and Anglia Ruskin University.		will be measured by both psychometric questionnaires and physiological measurements.		
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