

**Spirituality and its Contribution to Increasing
Psychological Resilience and Decreasing Burnout
amongst First Responders in the
City of Johannesburg**

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Declaration

I, Rebecca Jane Williams hereby declare that this dissertation submitted in partial fulfilment of the requirements for the Master of Disaster Management at the University of the Free State is my own work and has not been submitted to any other institution.

I also declare that I have acknowledged the sources used through in-text citing and a comprehensive list of references.



Dr Rebecca J. Williams

29 April 2021

Date

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Dedication

I would like to dedicate this thesis to the first responders in the City of Johannesburg who risk their lives every day to assist those in need and make this city a safer place to live.

May the findings from this study help to raise awareness of the tremendous difficulties faced by you in the course of your daily work and may the recommendations go some way towards reducing the trauma and psychological burden that many of you carry.

Abstract

First responders around the world suffer from high levels of burnout and other psychological symptoms related to their exposure to traumatic events. Psychological resilience is an important factor in mitigating the effects of this exposure, whereas the effects of spirituality/religiosity have not been clearly determined. The primary aim of this study was to determine the levels of work-related burnout and psychological resilience among first responders working in the City of Johannesburg. Furthermore, this study aimed to determine the levels of religiosity and spirituality in this population and their correlation with psychological resilience and work-related burnout.

A non-experimental, cross-sectional, and criterion-group design was used. Firefighters, emergency medical technicians and disaster managers employed by the City of Johannesburg were identified using purposive sampling, eventually constituting a sample of 111 participants. The Copenhagen Burnout Inventory, the Brief Resilience Scale, the Duke University Religion scale and a biographical questionnaire were used to gather information from the participants. Stepwise regression analysis was done to determine the association between burnout, resilience and religiosity/spirituality.

Results from the study showed that first responders had high levels of burnout and were not always able to access the help they required. Having attended stress management training correlated with higher resilience and lower burnout scores. For the sub-group of firefighters, higher levels of spirituality correlated with both increased resilience and lower burnout scores.

Based on these findings, recommendations were made for increased mental health awareness, training and access to support structures for first responders.

Keywords: First responder, Burnout, Spirituality, Psychological resilience, Johannesburg

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Abbreviations and Acronyms

BRS	Brief Resilience Scale
CBI	Copenhagen Burnout Inventory
CI	Critical Incident
CISD	Critical Incident Stress Debriefing
DM	Disaster Manager
DUREL	Duke University Religion Index
EAP	Employee Assistance Programme
EMS	Emergency Medical Services
FR	First Responder
IR	Intrinsic Religiosity
NORA	Non-organisational Religious Activity
ORA	Organised Religious Activity
PTSD	Post-traumatic Stress Disorder
R/S	Religiosity/spirituality
ST	Secondary Traumatization
UK	United Kingdom
USA	United States of America

Chapter 1

General Introduction to the Study

1.1 Introduction

Psychological resilience refers to factors that enable an individual to cope with, or even to thrive under, adverse or stressful conditions (Rauvola, Vega and Lavigne 2019; Rice and Liu 2016a; Windle, Bennett and Noyes 2011). These factors include behaviours, thoughts and actions that are not solely innate but that can be learned and developed giving the individual an increased ability to “bounce back” from adverse circumstances (Southwick et al. 2014). Exposure to traumatic or stressful events may however lead to adverse psychological consequences (Kleber 2019) and research has consistently demonstrated that first responders face a higher risk than the general population of developing mental health problems such as burnout, depression and post-traumatic stress disorder (PTSD) (Kerai, Khan, Islam, et al. 2017; SAMHSA 2018; Ward, Lombard and Gwebushe 2006). “First responders” (FRs) is a general term referring to police officers, firefighters, emergency medical services (EMS) workers and other trained members of non-governmental or community-based organisations who are involved when an accident or disaster occurs (Jones 2017). The nature of their occupation makes it likely that FRs will be exposed to both chronic stressors in the workplace and acutely stressful incidents (Sliter, Kale and Yuan 2014). These critical incidents may involve catastrophic injuries or death of victims as well as the risk of injury or death of the responder or co-worker (Donnelly, Bradford, Davis et al. 2016; MacDermid, Nazari, Rashid et al. 2019). The risk of adverse psychological consequences of trauma exposure is decreased with higher levels of psychological resilience in FRs (Hesketh, Cooper and Ivy 2015; Rowntree, Atayero, Diem O’Connell et al. 2015) which may be developed by training (Rice and Liu 2016b).

Studies have also shown that participation in religion or spiritual practices can be protective against the development of adverse psychological consequences (Austin, Macdonald and Macleod 2018; Weber and Pargament 2014;) and may be an important factor in protecting FRs who are regularly exposed to traumatic events (Boland, Mink, Kamrud et al. 2019; Ogińska-Bulik and Kobylarczyk 2015). Religion within South Africa is considered to be an important social dimension with only 5.2% of people in the 2015 General Household Survey identifying themselves as having no religion (Statistics South Africa 2015). Religion has been defined as “an institutionalized (i.e., systematic) pattern of values, beliefs, symbols, behaviours, and experiences that are oriented toward spiritual concerns, shared by a community, and transmitted over time in traditions” (Canda and Furman 2010). In contrast,

spirituality can be defined as “a universal and fundamental human quality involving the search for a sense of meaning, purpose, morality, well-being, and profundity in relationships with ourselves, others, and ultimate reality, however understood” (Canda and Furman 2010). From these definitions, it can be seen that spirituality is a broader concept than religiosity as spirituality encompasses both religious and non-religious expressions (Xu 2016).

Findings from research studies suggest that religiosity and spirituality (R/S) are related to better mental health, with positive religious coping correlating with positive outcomes after crises and that several R/S associated factors such as forgiveness and hope are associated with resilience (Foy, Drescher and Watson 2011; Weber and Pargament 2014). It has also been proposed that spirituality can support resilience programmes aimed at improving well-being in police forces in the United Kingdom (UK) (Hesketh, Ivy and Smith 2014). However, some studies have found a negative effect of R/S on psychological health (Prati, Pietrantonio and Cicognani 2011; Weber and Pargament 2014), possibly because a clear distinction has not been made between religiosity and spirituality (Nelson, Jacobson, Weinberger, et al. 2009). Coping strategies from a religious perspective may be positive, giving comfort and support, or negative, for example, seeing the stressor as a punishment from God (Harris, Erbes, Engdahl et al. 2011; Prati, Pietrantonio and Cicognani 2011; Weber and Pargament 2014; Xu 2016). It has been argued that religiosity and spirituality, as distinct concepts, may have different effects on mental health (Lorenz, Doherty and Casey 2019) and that failure to distinguish between them in studies, may have led to the contradictory results found in the literature (Koenig 2012; Lorenz, Doherty and Casey 2019).

The primary aim of this study was to determine the levels of work-related burnout and psychological resilience among first responders working in the City of Johannesburg. Furthermore, this study aimed to determine the levels of religiosity and spirituality in this population and their correlation with work-related burnout and psychological resilience.

1.2 Study area

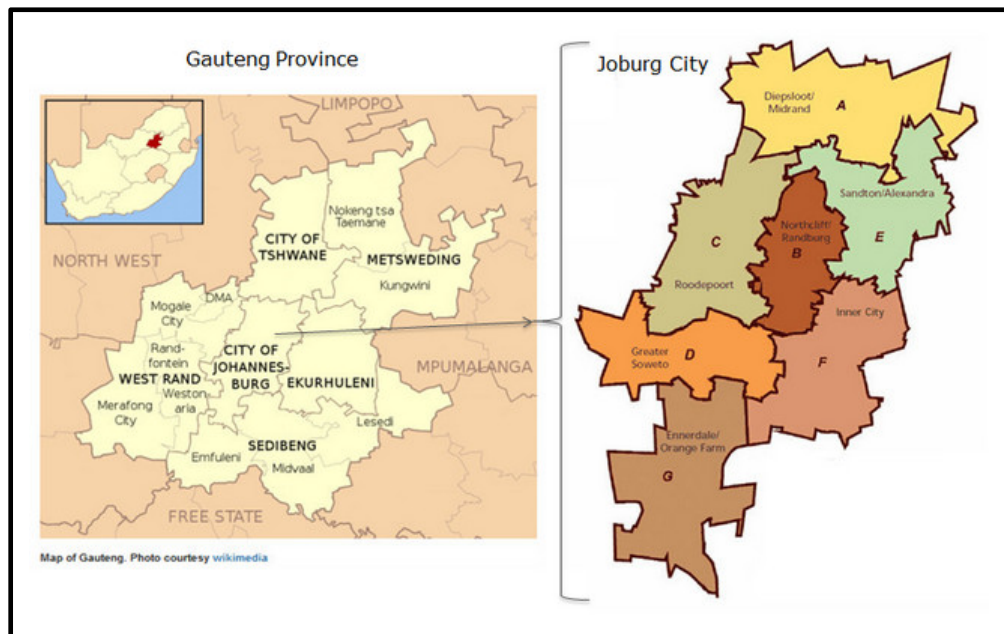
This research was undertaken by collecting data through questionnaires from first responders (fire fighters, EMS personnel and disaster management officers) employed by the City of Johannesburg, in the Gauteng Province in South Africa (Figure 1.1). The City of Johannesburg Metropolitan Municipality is comprised of seven administrative regions, of which Sandton/Alexandra is Region E (Figure 1.2). The firefighters and EMS interviewed were based in Region E, while the disaster managers (DMs) covered the whole of the City of Johannesburg.

The population of the region is estimated to be 394 000 (City of Johannesburg 2018). A total of 87% of the population are black, 11% white, 1% Indian and 1% coloured. The region comprises wealthy neighbourhoods such as Sandton and areas such as Alexandra which are considered to be high-risk areas due to high unemployment rates, informal settlement within the floodplain of the Jukskei River and uncontrolled population influx (City of Johannesburg 2018).



Source: Lowe, Gordon, Hall et al. 2019

Figure 1.1: Map of South Africa with Johannesburg highlighted



Source: City of Johannesburg 2017

Figure 1.2: Map of Johannesburg showing Sandton/Alexandra Region E

1.3 Preliminary literature review

Exposure to stress in the workplace is associated with increased absenteeism (McCraty and Atkinson 2012; Sliter, Kale and Yuan 2014), alcohol (Jahnke, Poston, Haddock and Murphy 2016) and substance (Joyce, Tan, Shand et al. 2019) misuse, development or exacerbation of mental health disorders including depression and suicide (Abbot, Barber, Burke, et al. 2015; SAMHSA 2018), burnout (Drewitz-Chesney 2012) and PTSD (Fjeldheim, Nöthling, Pretorius, et al. 2014; Haugen, Evces and Weiss 2012) in FRs. One study showed that 30% of paramedics took mental health leave at least once during their careers (Drewitz-Chesney 2012). Also, exposure to stress has consequences for physical health (Boland et al. 2019; McCraty and Atkinson 2012).

While most of the studies in FRs have been conducted in high-income countries, a PTSD prevalence of 19% was found among FRs in Ethiopia (Bezabh, Abebe, Fanta, et al. 2018) and similarly high rates amongst EMS in Pakistan (Kerai et al. 2017). Paramedic trainees in South Africa were found to have depression rates of 28%, and 16% of respondents met the criteria for PTSD diagnosis (Fjeldheim et al. 2014). Ward et al. (2006) analysed over 1 000 questionnaires from first responders working in the Western Cape Province of South Africa. They found that the rates of exposure of FRs to critical incidents (CIs) were significantly higher in their sample than in developed countries. Furthermore, the authors reported higher rates of general psychopathology than were found in similar studies in Europe.

Research suggests that the risk for the development of PTSD is higher in FRs working in conditions where there is a perceived threat of harm to the workers themselves (Benedek, Fullerton and Ursano 2007). The danger of violence faced by FRs in South Africa has been widely reported in the media (Palitza 2018) and a study of emergency medical care students at four South African universities found that 83% had witnessed violence against EMS personnel and 32% had personally been assaulted (Vincent-Lambert and Westwood 2019). The respondents in the Western Cape study (Ward et al. 2006) also mentioned “danger from the public” as a particular stressor. A systematic literature review (Murray, Davis, Shepler, et al. 2020) found that exposure of EMS to work-place violence increased levels of fear, stress and anxiety and in some studies was found to be the leading cause of stress. The authors postulated that responders placed themselves in danger due to both the expectations of the community and the internalised belief that the patient’s well-being should take precedence over personal safety. This tension between the desire to serve a community and the threat of violence from that same community is likely to be deleterious to FRs’ mental health. These studies also showed that a lack of resources and lack of organisational support are other factors that increase psychopathology amongst FRs. These are factors that are also likely to be an issue within the Johannesburg emergency services.

Given the levels of exposure to critical incidents (Ward et al. 2006), the threat of violence (Vincent-Lambert and Westwood 2019) and the relative lack of organisational resources (Maphumulo and Bhengu 2019), it seems probable that FRs in Johannesburg will be found to be suffering from high rates of symptoms related to stress in their work environments. The spectrum of symptoms and behavioural disorders that can be expected include anxiety, depression, stress-related disorders and PTSD, substance abuse, risk-taking behaviour, suicide and suicidal ideation, absenteeism, problems with sleep and difficulties with interpersonal relationships (SAMHSA 2018). Given that some intervention is required to improve the well-being of first responders, it is necessary to understand the factors that determine whether FRs will access help, and what mechanisms of intervention are effective. Research has shown that FRs tend to view psychological resilience as a personal attribute not requiring outside assistance (Crowe, Glass, Lancaster, et al. 2017). The “What’s Killing our Medics?” survey (Abbot et al. 2015) found that different subcultures existed within different EMS institutions. These subcultures related to whether management and/or peers supported accessing mental health resources. Suicidal ideation was markedly reduced in the respondents from those subcultures where the utilisation of mental health resources was encouraged by both peers and management. However, in about 20% of the sample surveyed by Abbot et al. (2015), there was no encouragement from either peers or

management to access any formal mental health support. Therefore, in order to make an intervention acceptable, it might be necessary to change the prevailing subculture within the emergency services.

Interventions can be categorised into primary, secondary or tertiary prevention (Skeffington, Rees and Kane 2013). Historically, interventions have focussed on treating mental health issues once they have surfaced, for example, tertiary prevention and treatment protocols have been developed for depression, acute stress disorder and PTSD by the American Psychological Association among others (American Psychological Association 2017). Secondary prevention involves targeting an individual or population exposed to a traumatic event before they develop symptoms. Historically, psychological debriefing sessions have been used but research does not support the efficacy of this approach (Qi, Gevonden and Shalev 2016).

There has been limited research on the primary prevention of stress-related disorders (Skeffington et al. 2013). A randomised controlled trial using a MAPS (Mental agility and psychological strength) training programme for recruits to the firefighting service in Australia (Skeffington, Rees, Mazzucchelli, et al. 2016) showed no significant difference in the two groups in the primary prevention of mental health issues. This study was faced with resource and time constraints and the authors suggested that the intervention might work better if applied to firefighters working in the field already, and not during the recruits' training programme. However, self-reported measures of resilience were shown to predict protection from PTSD and depression symptoms in FRs (Joyce et al. 2019) and a systematic review of resilience training programmes demonstrated an overall positive effect on individual resilience (Joyce, Shand, Tighe, et al. 2018).

Nwoye (2015) argues that western psychology has ignored human spirituality, defining people only in material, measurable terms, whereas African psychology accepts the invisible realm as an important source of influence. Koenig (2012) argues that there are many reasons for integrating the addressing of spiritual needs into clinical practice. A case has been made for integrating spirituality into the assessment and treatment of trauma survivors in a South African context (Magezi and Manda 2016). Analysis of research shows that positive religious coping is consistently correlated with positive adjustment after crises (Foy et al. 2011). Incorporating spirituality or religion into mental health treatment in an appropriate way has demonstrated benefit in many studies (Weber and Pargament 2014). For example, a group intervention including spirituality was shown to reduce PTSD symptoms in war veterans in the United States of America (USA) (Harris et al. 2011).

In the USA, Feemster (2009) argues that spirituality in law enforcement shapes practice, performance, vitality, and longevity, and that spirituality should be included in law enforcement training. Both the Federal Bureau for Investigation and various law enforcement agencies in the USA incorporate spirituality into their training and wellness programmes and consider spirituality to be an important therapeutic resource (Malmin 2013). Research carried out in both the UK and the USA suggests that embracing the spiritual dimension may assist police officers in developing coping strategies and improving job performance (Robinson 2019; Smith and Charles 2010). A study conducted in South Africa found that traffic officers utilised their spirituality to increase their adaptive coping abilities (Jacobs and van Niekerk 2017). Similarly, Employee Assistance Programmes (EAPs) in South Africa focus on employee wellness primarily from a biopsychosocial and spiritual perspective. A survey of EAP practitioners in South Africa indicated that 89% regarded their spirituality as "very" to "extremely" important and 88% said that clients discussed spiritual matters with them "very often" (46%) or "occasionally" (42%) (Van Wyk 2016).

This study focussed on the levels of religiosity/spirituality of FRs and their effect on work-related burnout and resilience levels.

1.4 Research problem

Several research studies from around the world demonstrate that FRs have a high risk of mental health symptoms (Abbot et al. 2015; Jahnke et al. 2016; Jones, Agud and McSweeney 2020; SAMHSA 2018). Employees in emergency service departments that encourage access to formal support institutions have decreased mental health symptoms and perceive the help as being effective (Abbot et al. 2015). Within the City of Johannesburg Public Safety Department, there is a Chaplaincy Department to provide spiritual care and an Employee Assistance Practitioner to assist with psychological needs, but it is not clear whether these services are acceptable and accessible to employees or not (Metsing 2016).

Various factors that have been shown to increase the risk of symptoms occurring in first responders are pertinent to the employees in Region E. These include having to attend frequent fires in informal settlements (Ward et al. 2006), a lack of support from management, under-resourcing and inadequately maintained equipment (SAMHSA, 2018), a culture of not accessing mental health (Abbot et al. 2015), the threat of personal harm and high rates of exposure to potentially traumatic events (Ward et al. 2006). The researcher was unable to find published research on burnout or psychological resilience in DMs as a distinct subgroup of FRs. Therefore, both DMs and firefighters/EMS were included in the study to enable a comparison of the two groups.

This research project was designed to determine the levels of religiosity/spirituality amongst FRs in Region E and their correlation with work-related burnout and psychological resilience.

1.4.1 Research questions

The following research questions were posed:

- 1) What are the levels of work-related burnout amongst FRs in Region E of the City of Johannesburg Metropolitan Municipality?
- 2) What are the associations between psychological resilience, levels of work-related burnout and religiosity/spirituality amongst this population?
- 3) What interventions for increasing resilience would be acceptable to this population?
 - a) Do the responders seek help from spiritual/religious sources?
 - b) Would they be prepared to attend training that included spiritual/religious content?

1.4.2 Objectives

- 1) To measure the levels of work-related burnout in FRs employed in Region E.
- 2) To determine the association between psychological resilience, levels of work-related burnout and religiosity/spirituality in the study population.
- 3) To ascertain what resources the respondents are already accessing and what would be acceptable to this population.

1.5 Methodology

1.5.1 Research design

This was a quantitative study that followed a cross-sectional design.

1.5.2 Study population

The participants were firefighters and EMS employed by the City of Johannesburg and working within Region E, and DMs employed by the City of Johannesburg.

1.5.3 Data collection tools

The respondents were asked to fill in a questionnaire by ticking the appropriate boxes (Appendix 1), three existing measurement scales were incorporated along with demographic questions and some specific questions designed to elicit information around training and sources of help.

1.5.4 Data analysis

The data obtained was coded, entered into a Microsoft Excel spreadsheet and edited to ensure accuracy. The data from the questionnaires was in the form of discrete variables. The results were summarised according to categorical and numerical variables. Categorical variables were summarised as percentages, and numerical variables were summarised as means and percentiles. A series of multiple regression analyses were conducted to determine the contribution of the variables to the spirituality, resilience and burnout scores.

1.6 Ethical considerations

Ethical approval for this study was obtained from the General Human Research Ethics Committee of the Faculty of Agricultural Sciences, University of the Free State (UFS-HSD 2020/0659/2205). Permission to conduct the survey was obtained from the Acting Executive Head of the City of Johannesburg Emergency Management Services and the Acting Divisional Head of the City of Johannesburg Disaster Management Centre. Participants in this study were informed about the voluntary nature of their participation, as well as the anonymity and confidentiality of individual responses. An information leaflet was made available to participants, informing them of the nature of work-related burnout and available psychological services in their area.

1.7 Limitations and delimitations

This study did not attempt to assign psychiatric diagnoses to the population in question. It was only intended to flag self-reported symptoms as an indicator of work-related burnout.

The study only addressed a group of FRs operating within a defined geographical area and may therefore not be generalisable to first responders working elsewhere in the Johannesburg Metropolitan Municipality.

1.8 Significance of this study

Studies across the world have demonstrated that FRs suffer from high levels of stress-related symptoms that impact on both their working and personal lives. Interventions to

increase psychological resilience are thus likely to be both beneficial and cost-effective. Very little research has been done within a South African context as to what types of intervention might be acceptable given the culture and worldview of the population. Targeting interventions to meet both the religious/spiritual and psychological needs of first responders might prove to be beneficial from both a social and economic perspective.

Chapter 2

Literature Review

2.1 Introduction

The purpose of this chapter is to provide a broad overview of the topics concerned, emphasising research findings mainly from the last ten years (Denney and Tewksbury 2013). It will begin with an overview of the nature and work of FRs with a specific emphasis on their role and exposure to trauma in a South African context. The possible psychological consequences of occupational exposure to stressful events will then be outlined along with the results of studies showing the incidence and prevalence of these outcomes in various FR populations across the world.

The next section outlines the nature of psychological resilience, its effect on psychological outcomes and factors that influence resilience, with particular reference to FRs. The concepts of R/S will then be addressed along with the results of research elucidating its relationship to outcomes following trauma. R/S within the context of FR occupations will then be addressed with a particular emphasis on South Africa.

The final section in this literature review considers interventions in various psychosocial, educational and spiritual domains and their effects on psychological outcomes and resilience in high-stress occupations.

2.2 First responders

2.2.1 Definition

When an accident, incident, or disaster occurs, many people will respond, including those members of the public who happen to be on the scene, as well as volunteers and those whose occupations require them to respond. This latter group encompasses trained professionals such as the police, firefighters, DMs and EMS (Argentero and Setti 2011; Meadows, Shreffler and Mullins-Sweatt 2011), whose role is to assist with the preservation of “life, property and the environment” (Greinacher, Derezza-Greeven, Herzog and Nikendei 2019). It is this latter group of professionally trained occupational first responders who will be referred to as “First Responders” (FRs) for the purpose of this literature review and study.

2.2.2 Types of first responders

Whilst different categories of FRs perform different roles during a response (Greinacher et al., 2019), they are all amongst the first to attend to victims and are therefore all exposed

regularly to events that may be disturbing or traumatic and which may put their own lives in danger (Haugen et al. 2012; SAMHSA 2018).

Although not an exhaustive list, the following categories of FRs are commonly recognised:

Emergency medical services

EMS is a broad term covering people or organisations who are trained and equipped to give medical assistance at the point of contact to people suffering from illnesses or injuries and to transport them to an appropriate medical facility (Greinacher et al. 2019; South Africa. National Health Act 2003). Within South Africa, EMS are mandated to be provided at the provincial level as a function of the Department of Health (Tesser 2020). However, in some municipalities, ambulance services have been combined with fire services under the umbrella of Emergency Management Services, as is the case in the City of Johannesburg Metropolitan Municipality (City of Johannesburg 2019).

Firefighters

In addition to fighting fires, firefighters are involved in search and rescue operations, incidents involving hazardous materials and responding to both natural and man-made disasters including dead body recovery (Jahnke et al. 2016; Morman, Schrod and Adamson 2020). Within the City of Johannesburg, firefighters are part of the Emergency Management Services and are responsible for running ambulances as well as fire trucks, thus the firefighters all have at least a basic or intermediate life support qualification, with at least one firefighter per shift having a paramedic qualification (City of Johannesburg 2019; Tesser 2020).

Police

Police officers are concerned with enforcing law and order; at the scene of an accident or disaster, they will generally, along with firefighters be in charge of safety issues and controlling bystanders (Greinacher et al. 2019; Manning 2014). Within South Africa, the South African Police Service functions at both national and provincial level to maintain law and order, prevent and investigate crime and protect people and property. The metropolitan police are mandated to prevent crime, police traffic and enforce by-laws (South Africa. South African Police Service Act 1995).

Disaster managers

These are professionals trained in disaster prevention, preparedness and response who co-ordinate a multi-sectoral approach in both pre-planning and running disaster

responses (MacFarlane, Joffe and Naidoo 2006). Within South Africa their role is defined by the Disaster Management Act which defines “Disaster Management” as the planning and implementation of measures to decrease the risk or severity of disasters, ensure emergency preparedness and response and assist with recovery and rehabilitation post-disaster (South Africa. Disaster Management Act 2002).

2.2.3 Occupational stressors for first responders

The nature of their occupation makes it likely that FRs will be exposed to both chronic stressors in the workplace and acutely stressful incidents (Sliter et al. 2014). The nature of such stressors will be considered before reviewing the research comparing the stresses inherent in the different FR occupations and specifically the South African context.

2.2.3.1 Chronic stressors

In any occupation, employees are exposed to daily stressors in the workplace. Such stressors may be considered to be chronic, they are generally low in intensity but frequently occurring, and include such factors as organisational and interpersonal issues, lack of resources (Regambal, Alden, Wagner, et al. 2015) and workload (Mind 2016; Sliter et al. 2014). This chronic stress may lead to burnout, physical illnesses and reduced job performance and satisfaction (Boland et al. 2019; Haugen McCrillis, Smid and Niidam 2017; Sliter et al. 2014). In a study focusing on Canadian paramedics, Donnelly and colleagues reported that post-traumatic stress symptoms significantly correlated to both chronic and acute or critical incident stress (Donnelly et al. 2016). In addition, CIs are often perceived by FRs as being more distressing when they are already struggling with chronic stressors (Halpern, Maunder, Schwartz and Gurevich 2012). Shift work and long working hours leading to poor sleep, as well as the physical demands of the work, are part of the chronic stressors faced by EMS and firefighters (Crowe et al. 2017; Mind 2016; SAMHSA 2018) and police officers (McCraty and Atkinson 2012; Ramey, Perkhounkova, Hein et al. 2017). Management and organisational issues, including lack of resources and opportunities and excessive paperwork have also been found to be causes of chronic stress in police officers (McCraty and Atkinson 2012; Ramey et al. 2017) and EMS (Drewitz-Chesney 2012).

2.2.3.2 Acute stressors

In addition to chronic workplace stressors, FRs are regularly exposed to acute stressors, traumatic stressors or CIs which are specific events that are intense or

stressful and may affect future functioning, either short or long-term (Halpern et al. 2012; Sliter et al. 2014). CIs for FRs usually involve injury or death of a co-worker, catastrophic injuries to victims especially if they are children, or known to the FR, burn victims and victims of violence, injury to self or risk of death (Donnelly et al. 2016; MacDermid et al. 2019; Pietrantonio and Prati 2008). Other stress factors involved with the provision of services include verbal or physical threats, risk of exposure to blood-borne illnesses and accidents involving emergency vehicles (Donnelly et al. 2016; MacDermid et al. 2019).

In a recent study, it was found that 85% of Canadian firefighters were exposed to a CI in a two-month period (MacDermid et al. 2019). These included threats of death to themselves or co-workers requiring police protection (25%) and half were exposed to blood or body fluids or dead victims (MacDermid et al. 2019). The CIs facing police officers include shooting, homicides, or major accidents (McCraty and Atkinson 2012; Ramey et al. 2017). One study looking at psychological symptoms related to stress in 26 occupations ranked firefighters third, EMS fourth and police eleventh, with paramedics having the worst stress-related physical symptoms. Also, EMS ranked second and police officers third in terms of low job satisfaction (Szeto, Dobson and Knaak 2019). Other studies have shown stress and burnout to be worse in EMS compared with other FRs (Kerai et al. 2017). A systematic review of studies involving secondary traumatic stress in FRs indicated that in some studies firefighters showed more symptoms than EMS workers did, whereas in other studies rescue service workers were at higher risk than firefighters. Also, overall, female FRs in whichever sector showed more symptoms of secondary traumatization than males (Greinacher et al. 2019).

2.2.3.3 Occupational stressors for first responders in South Africa

While FRs throughout the world are exposed to both chronic workplace stressors (Sliter et al. 2014) and acute stressors due to critical incident exposure (MacDermid et al. 2019), these are likely to be heightened in low and middle-income countries (Kironji, Hodkinson, de Ramirez, et al. 2018). In South Africa, the provision of services is organised at three governmental levels or spheres: national, provincial and local, with emergency medical services mandated to be provided at provincial level, and emergency fire services at municipal level (South Africa. Department of Cooperative Governance 2020; Tesser 2020). Emergency and healthcare systems in South Africa face issues caused by rapid urbanisation, underfunding, unequal distribution of resources, lack of trained personnel and poor management

(Maphumulo and Bhengu 2019). This has been exacerbated in the fire services by the requirement for municipalities to fund fire services, leading to chronic underfunding in many instances (South Africa. Department of Cooperative Governance 2020). These issues of underfunding, poor management and lack of training are likely to contribute to the chronic workplace stressors experienced by FRs. A study looking at stressors for EMS in Gauteng Province, South Africa, confirmed that most of the stressors the FRs experienced were chronic organisational stressors including lack of resources, inadequate support, staffing shortages and inadequate pay and job opportunities (Naudé and Rothmann 2003). Similar results were obtained by Ward and colleagues (Ward et al. 2006) for emergency services workers, including firefighters, EMS and traffic police in the Western Cape Province. In his study, workplace issues were mentioned more often than critical incidences as sources of stress.

In addition to these chronic stressors, exposure to high rates of CIs is likely to be the norm for FRs in South Africa. Due to safety and security issues around violent crime and the fear of violence, South Africa ranked only 123 out of 163 in the Global Peace Index for 2020 (Institute for Economics and Peace 2020). Also, South Africa ranks 159 out of 175 countries for road safety, with a road traffic fatality rate higher than both the world and Africa's averages (World Health Organization 2018). It would therefore be anticipated that FRs in South Africa would be exposed to higher rates of CIs than their counterparts elsewhere. This was confirmed by a study in the Western Cape which demonstrated much higher CI exposure for the South African FRs than elsewhere, 88% of their respondents reporting a CI in the previous two months, compared with Swedish ambulance drivers, only 61.6% of who reported ever having attended a CI (Ward et al. 2006). Given the exposure rates of FRs in general and FRs in South Africa in particular, to high levels of both acute traumatic and chronic workplace stressors, the possible psychological and physical consequences of such exposure will now be considered.

2.3 Psychological and physical sequelae of exposure to stress

Stressful working conditions are associated with increased absenteeism (McCraty and Atkinson 2012; Sliter et al. 2014), alcohol (Jahnke et al. 2016) and substance (Joyce, Tan, et al. 2019) misuse, development or exacerbation of mental health disorders including depression and suicide (Abbot et al. 2015; SAMHSA 2018), burnout (Drewitz-Chesney 2012) and PTSD (Haugen et al. 2012; Fjeldheim et al. 2014). One study showed that 30% of paramedics took mental health leave at least once during their careers (Drewitz-Chesney

2012). Exposure to stress also has adverse consequences for physical health (Boland et al. 2019; McCraty and Atkinson 2012).

Given the high exposure of FRs to both acute and chronic stress as outlined above, the possible psychological, behavioural and physical consequences will now be detailed.

2.3.1 Depression and suicidal ideation

Depression, as a psychiatric disorder, is characterised by a lowered mood or loss of pleasure or interest in life, occurring almost daily for at least two weeks, resulting in impaired functioning (American Psychiatric Association 2013). In the United States, major depressive disorder occurs in about 7% of the general population, with females affected more commonly than males (Jones 2017). However, research suggests that rates of depression are higher amongst FRs than the general population (Jahnke et al. 2016) with rates ranging between 7% and 22% (Jones et al. 2020). Some studies have shown particularly high risks for depression amongst female firefighters, up to 38.5% in one study (SAMHSA 2018). Paramedic trainees in South Africa were found to have depression rates of 28% (Fjeldheim et al. 2014).

In the United States, a survey of firefighters and EMS showed that 37% had had suicidal ideation, or thoughts about committing suicide, more than ten times the rate of the general population (Abbot et al. 2015). Another study demonstrated a sixfold increase in suicide attempts for professionals who were involved in both EMS and firefighting compared with firefighting alone (SAMHSA 2018). Other risk factors for suicide include the co-occurrence of both major depressive disorder and PTSD (Jones 2017), occupational stress, decreased peer support, relationship problems and alcohol misuse (Chae and Boyle 2013; Jones et al. 2020).

2.3.2 Post-traumatic stress disorder

Following exposure to a serious traumatic stressor or CI, PTSD may develop. Symptoms last for longer than a month and include negative alterations in mood and cognition, hypervigilance, avoidance behaviour and intrusion symptoms such as flashbacks. The person's ability to function in normal life is impaired (American Psychiatric Association 2013).

Meta-analyses have shown that whilst the prevalence of PTSD is 1.3–3.5% in the general population, it is around 10% in FRs (Joyce, Tan et al. 2019), with some studies showing rates as high as 37% (Jones et al. 2020). A systematic review (Brooks, Dunn, Amlôt et al. 2016) concluded that repeated exposure to traumatic events was correlated with greater

rates of PTSD in FRs, with some studies showing the length of employment to be a risk factor while others found it to be protective. A number of the studies reviewed showed that perception of risk to oneself was a strong predictor of PTSD. Some studies also demonstrated differences between the occupational groups in terms of PTSD rates, with EMS tending to have the highest prevalence (Kerai et al. 2017). The prevalence of PTSD has been determined in various countries and occupational groups; for example, 4.5% of disaster workers in the USA responding to multiple hurricanes in one season were found to have probable PTSD nine months after the hurricanes (Fullerton, McKibben, Reissman et al. 2013). In the UK, one study demonstrated that 22% of EMS met the criteria for PTSD diagnosis (Rowntree et al. 2015). Other studies have shown 19% of police recruits and 50% of paramedics have symptoms consistent with PTSD (Regehr and Leblanc 2017). While most of the studies of PTSD in FRs have been conducted in high-income countries, a PTSD prevalence of 19% was found among FRs in Ethiopia (Bezabh et al. 2018) and similarly high rates amongst EMS in Pakistan (Kerai et al. 2017). A study of FRs in the Western Cape Province, South Africa (Ward et al. 2006) showed that exposure to CIs and rates of PTSD symptoms were higher than in higher-income countries. Also in the Western Cape, 16% of paramedic trainees studied were found to meet the criteria for PTSD (Fjeldheim et al. 2014). While the exact prevalence of PTSD symptoms may vary between responder groups and countries, the levels are consistently and significantly above those of the general population.

2.3.3 Secondary traumatisation

Many terms with slightly different nuances have been coined to describe the psychological effects that may occur in a person who is exposed to someone else's traumatic events, or accounts of those events (Rauvola et al. 2019). Vicarious traumatisation occurs when a caregiver's worldview or inner constructs are disrupted through exposure to the client's traumatic accounts (Rauvola et al. 2019). Secondary traumatic stress or secondary traumatic stress disorder, describe the symptoms, cognitive and behavioural changes that mimic PTSD and occur in a caregiver exposed to a client's stress (Figley 1995). Compassion fatigue is usually seen as a composition of secondary traumatic stress, which is acute, and burnout which is a chronic process of emotional exhaustion (Figley 1995; Rauvola et al. 2019). From a psychological perspective, secondary traumatic stress occurs as a result of a rescue-caretaking response when distress occurs in the rescuer as a result of perceived failure (Cocker and Joss 2016). Burnout, which is considered in more detail below, occurs when an individual's assertiveness-goal achievement response is thwarted (Cocker and Joss 2016). As some of the terms are used somewhat interchangeably in the

literature, the term secondary traumatisation (ST) will be used to cover psychological consequences including vicarious traumatisation, secondary traumatic stress and compassion fatigue (Greinacher et al. 2019) with burnout as a separate construct.

A systematic review of ST in FRs (Greinacher et al. 2019) showed a prevalence of ST of between 4% and 13%, with females generally showing higher ST than males and some studies showing firefighters to be more at risk than EMS. In a qualitative study of FRs in a South African context, Van Straten (2019) found that EMS who had to write death notifications and inform relatives of the deaths found this to be a particularly distressing aspect of their work as they had to deal with the grief and shock of the families although they had no formal training to do this. However, there is a dearth of information on the prevalence of ST in FRs within the South African context.

2.3.4 Burnout

Burnout as a construct is closely allied to ST; with several studies among FRs indicating a consistent correlation between the two (Greinacher et al. 2019). However, for burnout to develop there need to be ongoing negative experiences, not necessarily traumatic in nature, whereas the development of ST requires traumatic event(s) (Greinacher et al. 2019).

Burnout is defined as a psychological syndrome with three main attributes: emotional exhaustion, feelings of depersonalisation and ineffectiveness or lack of personal accomplishment (Maslach 1982). These lead to emotional fatigue and maladaptive behaviours such as disengagement and distancing (Rauvola et al. 2019). Burnout has been linked to chronic workplace stressors in FRs and has also been shown to be linked to traumatic stressors in firefighters (Sliter et al. 2014). One study of EMS workers demonstrated a burnout prevalence of 17%, with social support outside the workplace and religious beliefs as protective factors (Boland et al. 2019). Burnout levels in FRs have also been shown to be related to poor social support in the workplace and improved support leads to a reduction in burnout levels (Setti, Lourel and Argentero 2016).

Paramedics in Johannesburg were found to have a burnout prevalence of 30%, this being higher than levels found internationally (Stassen, Van Nugteren and Stein 2013). The study showed no significant differences according to gender or years of experience. A similar burnout prevalence level of 31% was found among paramedic students at a university in Johannesburg (Stein and Sibanda 2016). These high levels of burnout in South Africa may be related to both the high exposure to traumatic stressors as well as workplace stressors due to issues such as under-resourcing (Stassen et al. 2013).

2.3.5 Physical problems

As well as the psychological consequences outlined above, exposure to stressful events in FRs may lead to physical issues such as sleep disorders, musculoskeletal problems, obesity and fatigue (Boland et al. 2019; Cocker and Joss 2016). This is a result of chronic activation of the stress response systems. Exposure to a stressful situation activates the body's sympathetic nervous system, the "fight or flight" response. Repeated exposure to CIs over time leads to dysregulation, and eventual depletion of the body's reserves (McCraty and Atkinson 2012), with physical health sequelae. For example, police officers have been shown to have higher rates of hypertension, cardiovascular disease and cancer than people in more clerical occupations (McCraty and Atkinson 2012).

2.3.6 Social and economic cost

The psychological and physical sequelae of exposure to chronic and traumatic stressors have been shown to lead to poor job performance, increased absenteeism and early retirement in the police (Hesketh et al. 2015; McCraty and Atkinson 2012), EMS (Drewitz-Chesney 2012) and firefighters (Sliter et al. 2014).

Increasing burnout levels have been shown to correlate directly with increased absenteeism (Kristensen, Borritz, Villadsen and Christensen 2005). In 2016, depression cost the South African economy 5.7% of its gross domestic product or R232 billion due to loss of work productivity according to a study from the London School of Economics (Fin24 2017). Although there are no figures available for the cost of absenteeism in FRs in South Africa, the scale of the psychological issues outlined above suggests that the amount would be considerable. The social costs to the FRs and their families of these disorders are also incalculable, making it imperative that urgent steps are taken to reduce the burden of these consequences.

Whilst many FRs suffer psychological consequences from their occupations, many more do not, and it is this concept of psychological resilience that enables some people to withstand chronic and traumatic stressors that will now be considered.

2.4 Psychological resilience

People vary in their physiological and psychological responses to traumatic or stressful events depending on such factors as their genetics, past experiences, social context and the nature of the event (Benedek et al. 2007). With the emergence of positive psychology, there has been an emphasis shift away from psychopathology towards positive strengths that can be developed and hence the concept of resilience emerged (Rauvola et al. 2019).

While the concept has been variously defined, a synthesis of 270 research articles produced the following definition (Windle et al. 2011):

Resilience is the process of negotiating, managing and adapting to significant sources of stress or trauma. Assets and resources within the individual, their life and environment facilitate this capacity for adaptation and 'bouncing back' in the face of adversity. Across the life course, the experience of resilience will vary.

Exposure to trauma need not necessarily have negative consequences; positive changes, or posttraumatic growth have been reported in many populations (Hesketh et al. 2015) including ambulance personnel (Pietrantonio and Prati 2008). Compassion satisfaction as a corollary to compassion fatigue has also been described. This is a description of the positive feelings and benefits gained from contributing to people's and society's well-being (Pietrantonio and Prati 2008; Rauvola et al. 2019) and is thought to be protective against the development of ST and compassion fatigue in FRs (Rauvola et al. 2019).

Resilience closely correlates with social, emotional and psychological well-being (Kyriazos, Stalikas, Prassa, et al. 2018), physical health (Crowe et al. 2017), job satisfaction and performance (Crowe et al. 2017; Rice and Liu 2016b; Kyriazos et al. 2018) and increases the likelihood of post-traumatic growth in EMS (Rowntree et al. 2015) and firefighters (Ogińska-Bulik and Kobylarczyk 2015).

Resilience has been shown to decrease the risk of many of the psychological consequences of trauma exposure (Hesketh et al. 2015; Rowntree et al. 2015) for example, decreasing the risk of PTSD in police officers following critical incident exposure (Lee, Choi, Kim et al. 2016) and resilience was also demonstrated to be protective against future mental health difficulties in a cohort of police officers after Hurricane Katrina (SAMHSA 2018) and in paramedics in the UK (Joyce, Tan et al. 2019). Low resilience scores in paramedic trainees in South Africa were found to be significant predictors of PTSD symptoms (Fjeldheim et al. 2014). Resilience is also negatively associated with burnout in paramedics (Froutan, Mazlom, Malekzadah and Mirhaghi 2018).

Resilience is not static over time, being influenced by circumstances, culture and experiences and may be developed by training (Hesketh et al. 2015; Rice and Liu 2016b; Rowntree et al. 2015).

In conclusion, resilience is both a protective factor, decreasing the likelihood of future psychopathology and a positive predictor of future well-being.

2.5 Religiosity/Spirituality

Historically, the western scientific paradigm, and psychology and psychiatry in particular, have tended to ignore the religious or spiritual aspects of people's existence (Pearce, Pargament, Oxhandler et al. 2019; Weber and Pargament 2014). As postmodernism developed towards the end of the twentieth century, R/S increasingly became the subject of scientific research and incorporation into clinical practice (Austin et al. 2018; Canda and Furman 2010; Koenig 2012; Xu 2016).

In an African context, Nwoye (2015) argues that western or mainstream psychology is problematic as it tends to ignore the influence of spirituality in the lives and cultures of African people. In contrast, African psychology conceptualises the universe and humanity as being both physical and spiritual, with these realms being interdependent, and God or the spiritual world being involved in the details of human experience (Nwoye 2013). The literature affirms that acknowledgement of spirituality should be incorporated within mental health provision (Janse van Rensburg, Myburgh, Szabo et al. 2013; Forrester-Jones, Dietzfelbinger, Stedman et al. 2017). Given that FRs are frequently exposed to death, and that spirituality is concerned, at least in part, by the meaning and purpose in life, spirituality is likely to be particularly important in the context of FRs in South Africa.

Religiosity and spirituality will now be defined before considering their effect on psychopathology. The role of R/S in the FR professions will then be outlined before considering the South African context.

2.5.1 Definitions

Religion may be defined as:

a system of beliefs, values, rituals, and practices shared in common by a social community as a means of experiencing and connecting with the sacred or divine (Foy et al. 2011).

Spirituality, however, embraces a much broader concept than religiosity, involving meaning-making, purpose and connection, and therefore may be present in people who consider themselves to be religious or not religious at all (Austin et al. 2018; Canda and Furman 2010; Nelson et al 2009). Conversely, religiosity does not guarantee spirituality as people may participate in religious practices without finding a deeper meaning in them (Nelson et al. 2009).

2.5.2 Religiosity/Spirituality and psychopathology following trauma

In general, studies show that R/S is protective against the development of anxiety and depression (Austin et al. 2018; Weber and Pargament 2014). However, some studies have shown a negative effect of R/S on psychological health (Prati et al. 2011; Weber and Pargament 2014), possibly because a clear distinction has not been made between religiosity and spirituality (Nelson et al. 2009). Coping strategies from a religious perspective may be positive, giving comfort and support, or negative, for example, seeing the stressor as a punishment from God (Harris et al. 2011; Prati et al. 2011; Weber and Pargament 2014; Xu 2016). One study showed that higher spirituality scores correlated with both overall better psychological health and lower perceived stress levels, suggesting that spirituality mediates both how stressors are interpreted and the psychological response to them (Reutter and Bigatti 2014). Research has also shown that incorporating a person's beliefs into mental health assessment and treatment improves outcomes (Pearce et al. 2019; Weber and Pargament 2014).

2.5.3 Religiosity/Spirituality in first responders

Spirituality has been recognised as being important for police officers for many years, reducing stress and enhancing job performance (Feemster 2009; Hesketh et al. 2014; Robinson 2019). Working with the Federal Bureau for Investigation in the USA, Feemster (2009) asserts that spirituality should be included in all officer training as it improves performance, helps with stress management and increases longevity. In one study in the USA all the police officers questioned stated that their spirituality helped them to process the traumatic occurrences that they witnessed (Smith and Charles 2010). In the UK, Hesketh and colleagues outlined four aspects of spirituality that were important both individually and organisationally within the police force (Hesketh et al. 2014). These were connectedness, finding meaning, a holistic approach to life and work and inclusivity. Finding meaning in life and purpose in work appears to be a particularly important aspect of spirituality that enables FRs to cope with stress (Hesketh et al. 2014). In EMS workers the use of R/S is associated with both decreased burnout levels (Boland et al. 2019) and post-traumatic growth (Ogińska-Bulik and Kobylarczyk 2015).

2.5.4 Religiosity/Spirituality in South Africa

African psychology recognises the role of spirituality in the life of African clients with the overwhelming majority of the population believing that God is involved in everyday life (Nwoye 2015). In the 2015 General Household Survey (Statistics South Africa 2015), 86% of South Africans identified themselves as Christian, 5.4% as following traditional religions

and 5.2% as “nothing in particular”. Muslims accounted for 1.9% and Hindus 0.9%. Over 75% of Muslims attended religious services at least once a week, compared with 52.5% of Christians, 36.6% of Hindus and only 26.5% of those following ancestral or traditional religions. Given the above statistics, it would be expected that FRs in South Africa would have high levels of R/S. To date, very little research has explored R/S in South African FRs. However, in one study, 86% of FRs viewed themselves as religious and 79% as spiritual (Schröder 2012). Spirituality was found to be an important part of South African FRs’ worldviews and therefore the author concluded that it would be necessary to include spirituality in any interventions for trauma-related psychopathology (Van Straten 2019). The vast majority of South African Police Service employees thought that religion was important for themselves both as individuals and as employees (Joubert and Grobler 2013). Traffic police were also found to use their spirituality to help them to cope in stressful situations (Jacobs and van Niekerk 2017).

The final section of this literature review considers the various interventions and training programmes that have tried to assist FRs in their ability to deal with stressors.

2.6 Factors that increase resilience and mitigate the effects of stress

The high levels of psychological problems in FRs because of their exposure to both workplace and traumatic stressors were outlined above. Prevention of the development of psychopathology as a result of trauma can be divided into primary prevention which occurs before the traumatic event; secondary prevention which takes place after a traumatic event but before the development of psychological symptoms, and tertiary prevention which occurs after symptoms become apparent (Burbiel 2015). Primary prevention includes interventions such as resilience training and stress management programmes; the classic example of secondary prevention is Critical Incident Stress Debriefing (CISD) and tertiary prevention usually requires referral to a counsellor or mental health professional (Skeffington et al. 2016). The emphasis in recent times has shifted towards pre-incident intervention with Emergency Services taking a more intentional approach to employee well-being (Wild, Greenberg, Moulds et al. 2020).

The role of organisational culture and interventions that can be made in that domain to decrease chronic workplace stressors will first be considered before outlining the evidence for the efficacy of various training programmes and CISD. The role of social support and the functions of different professionals will then be considered.

2.6.1 Organisational culture

In his work on compassion fatigue, Figley (1995) identified aspects of the organisational culture that either worsened or mitigated the likelihood of compassion fatigue. He determined that a hierarchical structure, excess bureaucracy and apportioning of blame increased its likelihood. In contrast, a corporate culture of affirmation, problem-solving, and social support decreased the likelihood of psychopathology. Ochberg (1991) identified three principles of post-traumatic therapy. First, the individuality principle emphasises that everyone has their own particular needs and recovery pathway. Second, reactions are normal after exposure to a traumatic event, the normality principle. Third, that an individual should be empowered to be involved in their own recovery.

In disaster responders, a work culture of lack of support and poor relationships with supervisors predicts the development of both PTSD and depression (Brooks et al. 2016). Poor supervisor relationships were also found to be a major reason why South African paramedics leave the service (Hackland and Stein 2011). Conversely, organisational support increases well-being and longevity and decreases stress (Wild et al. 2020). A review of the literature identified organisational stress as positively correlating with police suicide (Chae and Boyle 2013). These organisational factors are stressors in both the police force (Chae and Boyle 2013; Ramey et al. 2017) and EMS (Donnelly et al. 2016; Vaughan, Moran, Pearce and Hearty 2016), and include long working hours, shift work and a rigid hierarchy.

Attempted suicide rates are much lower in FR organisations where the culture of the organisation supports mental health (Abbot et al. 2015) and FRs rate of recovery from a CI correlates with organisational support (Vaughan et al. 2016). The stigma around mental health issues has been shown to inhibit help-seeking (Donnelly et al. 2016; Haugen et al. 2017; Wild et al. 2020). A “macho” culture of suppressing emotional responses is very prevalent amongst paramedics (Drewitz-Chesney 2012) and other FRs (Crowe et al. 2017; Malmin 2013). A meta-analysis (Haugen et al. 2017) showed that one third of FRs experiences stigma around mental health, mostly around the negative impact on career progression and confidentiality, while almost 10% experience difficulty in accessing care. One of the main barriers to accessing help in FRs, is a lack of knowledge around the symptoms and signs of mental health issues following exposure to stress (Jones et al. 2020). Programmes in the workplace targeting the stigma around mental health have generally had positive results (Szeto et al. 2019). The “Blue Light Programme” targeting FRs in the UK, with training around mental health issues, improved the FRs’ confidence to seek support and decreased the stigma around mental health issues (Mind 2016).

The above indicates that changes to workplace structure and culture could have a positive influence on the well-being and longevity of FRs, both decreasing the prevalence of psychopathology and increasing help-seeking behaviour should it occur. Other preventative interventions in the form of training programmes will now be outlined.

2.6.2 Education and training

Pre-incident interventions such as training programmes include organisational training for managers, operational training, psychoeducation such as stress management and programmes designed to improve well-being or resilience (Wild et al. 2020).

2.6.2.1 Operational training

A systematic review of employees' well-being in a disaster response context showed that pre-disaster operational training, for example skills development and preparation for working in a disaster context, led to improved confidence and less psychopathology (Brooks, Dunn, Amlôt and Rubin 2018; Wild et al. 2020). In firefighters, competence, training, preparedness and knowledge in their profession is one of the strongest protective factors against psychological problems (Skeffington et al. 2016; SAMHSA 2018).

2.6.2.2 Organisational training

A randomised trial of a mental health training course for managers in the Australian fire services showed that employees of those managers who had attended the course had a significant decrease in days off work due to sickness (Wild et al. 2020). In the UK, the mental health charity MIND, has demonstrated good results from their managerial training programmes for both police and ambulance staff (Mind 2016; Wild et al. 2020). One literature review demonstrated reductions in burnout scores in 82% of cases across 25 studies, with a combination of individual training and organisational intervention producing longer-lasting positive effects than either alone (SAMHSA 2018).

2.6.2.3 Psychoeducation

Psychoeducational programmes typically cover topics such as stress and the stress response, sleep, mindfulness and education around mental health symptoms (Wild et al. 2020). They also include a skills-based component such as relaxation techniques or coping skills (Forbes and Fikretoglu 2018; Skeffington et al. 2013). Recent trials demonstrate that although participants report improved awareness and confidence around mental health issues, there is no significant improvement in psychological outcomes at follow-up (Skeffington et al. 2016; Wild et al. 2020).

2.6.2.4 Resilience training

Programmes targeting resilience are effective in improving resilience scores in FRs (Grill, Gunderson, Callahan and Marks 2014; Joyce et al. 2018; Skeffington et al. 2013), including programmes employing mindfulness techniques (Joyce, Shand et al. 2019) and feedback measurements of heart rate variability (McCraty and Atkinson 2012; Ramey et al. 2017). However, whether this improved resilience translates into decreased psychopathology is unclear, due in part to limitations in follow-up times (Skeffington et al. 2016). A recent review suggested that half the interventions had no measurable, sustainable effect on outcomes related to physical or mental health measures (Wild et al. 2020). It also showed that the most effective resilience interventions targeted specific modifiable risk factors, such as maladaptive cognitive processes and disengagement. These led to improved well-being and resilience scores and decreased stress, but again it is not clear whether this translates into reduced psychopathology. In Canada, a meta-analysis of the “Road to Mental Readiness” programme for FRs which aimed to increase resilience and reduce stigma showed a positive effect on workplace culture, increased resilience amongst participants and decreased stigma across five different first responder occupations (Szeto et al. 2019). It is not known whether these effects persist past the three months follow up, or whether they will lead to reduced psychopathology. In the UK, FRs who participated in a resilience course showed significant improvements in mental health symptoms and awareness, increased well-being and decreased psychological distress levels (Mind 2016).

2.6.2.5 Exercise

As well as providing physical benefits (Warburton, Nicol and Bredin 2006), exercise reduces anxiety and depression and improve mental health overall (Sharma, Madaan and Petty 2006). Police officers who were assigned to exercise three times a week for eight weeks showed large increases in well-being and quality of life measures compared to controls (Norris, Carroll and Cochrane 1990). A second study, also amongst police officers, demonstrated improved psychological functioning from regular circuit training over four months (Norvell and Belles 1993). In her systematic review, Wild et al. (2020) concluded that regular exercise could contribute to increased coping after CIs, by reducing low mood and stress and hence improving problem-solving ability, leading to decreased risk of psychopathology.

2.6.3 Critical incident stress debriefing

Psychological debriefing was widely used in the 1980s and 1990s, but a negative Cochrane review in 1997 led to this method being used less widely routinely (Qi et al. 2016). Initially

developed by Mitchell, CISD is the classic example of a group intervention for FRs after a CI, designed to reduce the risk of PTSD (Everly 1995). With its theoretical base in both crisis intervention and educational intervention theories, it provides a safe environment and process for people to talk about a recent CI.

Brooks et al. (2018) conducted a systematic review of psychological interventions for professionals working in disaster situations. The ten studies of psychological debriefing showed mixed results and the authors concluded that the routine use of psychological debriefing post-disaster was not supported, and further research was required to assess whether it might be useful in some situations. Some studies have suggested that by altering the natural coping responses, CISD may prove to be harmful (Jones et al. 2020; Skeffington et al. 2016) and that requiring FRs to attend a debriefing on a day-off might actually increase their stress levels (Donnelly et al. 2016).

2.6.4 Social support outside the workplace

Most studies show that poor social support is associated with anxiety and depression, ST and burnout, PTSD and decreased help-seeking (Brooks et al. 2016; Morman et al. 2016; Setti et al. 2016). Meta-analyses demonstrate that social support protects FRs from developing ST (Greinacher et al. 2019; Prati and Pietrantonio 2010), with the perceived social support being a stronger protective factor than the actual support. Burnout is associated with a lack of social support in EMS (Boland et al. 2019; Crowe et al. 2017). More than 80% of Canadian EMS reported that they would talk to a friend or family member about work-related stress (Donnelly et al. 2016). Findings are similar for police officers generally (Boland et al. 2019) and in South Africa specifically (Wassermann, Meiring and Becker 2019). Poor social support also predicted PTSD in South African paramedic trainees (Fjeldheim et al. 2014).

Crowe et al. (2017) found that EMS viewed social support as a factor that increased resilience but viewed their home and social environment as a place to relax rather than a place to process trauma, which they tended to do internally. Interviewing South African FRs, Van Straten (2019) found that male FRs preferred to talk to their spouses about their work experiences, however, they struggled to share their emotions as they felt that it was difficult for families to understand their experiences. In their study of coping strategies amongst EMS in Gauteng, Naudé and Rothmann (2005) found that English and Afrikaans first language speakers were significantly less likely to use social structures for support than their African-language speaking colleagues.

2.6.5 Peer support

Peer support has been shown not only to be an acceptable (Schröder 2012), but also an effective (Morman et al. 2020) way to mitigate the effects of stressful events for first responders. A survey of Canadian paramedics showed that 50% would talk to a co-worker about work-related stress and 17% to a supervisor (Donnelly et al. 2016). This is similar to results in both police and firefighters (Chae and Boyle 2013; SAMHSA 2018). In a study of South African paramedics, 87% indicated that they would be more likely to talk to a colleague than anyone else about a work-related experience (Schröder 2012). Firefighters who have good peer relationships show increased job satisfaction and lower effects of stress (Morman et al. 2020). In a systematic review of research on employees working in disaster situations, Brooks et al. (2018) concluded that good relationships with peers and supervisors helped mitigate psychological impacts and that training employees to support their peers, for example using Psychological First Aid (World Health Organization, 2011) could be beneficial. Conversely, poor relationships with both peers and supervisors predict PTSD (Brooks et al. 2016). In public health agencies in the USA, peer support programmes have become standard practice where staff are exposed to traumatic events (SAMHSA 2018). However, it has been suggested that it is more effective for training to occur in small groups with FRs who already work with one another to facilitate increased peer support and to increase FR's psychosocial competencies (Jones et al. 2020; Prati and Pietrantonio 2010).

2.6.6 Professional help

The main professionals available to help FRs who are struggling with occupational stress are counsellors, Employee Assistance Programme Practitioners (EAPs), chaplains and psychologists. Such interventions occur after psychological problems emerge and there are many barriers to accessing them including stigma around mental health and resource constraints (Chae and Boyle 2013; Donnelly et al. 2016; Jones et al. 2020), with only 39% of Canadian paramedics surveyed indicating that they would talk to an EAP or other therapist (Donnelly et al. 2016). In a large study of EMS in the USA, 34% had sought help, of whom 41% used peer-counselling, 35% private mental health professionals and 26% EAPs (Abbot et al. 2015). Even firefighters who have work-based mental health programmes available to them are more likely to seek help from family or private professional services (Jones et al. 2020). FRs also tend to view psychological coping as a personal matter and did not tend to identify counsellors and other professionals as being a source of help (Crowe et al. 2017). They also preferred to consult with someone who has had similar job experience of trauma exposure (Abbot et al. 2015; Jones et al. 2020). The

lack of awareness of how trauma is connected to mental health may also inhibit FRs from accessing psychological support even when it is available (Robinson 2019).

The following professionals are available to varying degrees within the South African emergency services (Joubert and Grobler 2013; Van Straten 2019; Van Wyk 2016):

2.6.6.1 Employee assistance programmes

EAPs are employer resourced programmes designed to assist employees with difficulties they are experiencing in the workplace due to personal or work-related issues, including emotional and mental health problems (Van Wyk 2016). In a study of Canadian paramedics, 39% indicated that they would consult an EAP practitioner or other therapist for a stress-related matter (Donnelly et al. 2016).

In South Africa, this programme may include the services of social workers and counsellors (Mogorosi 2009). A 2020 White Paper on fire services from the Department of Cooperative Governance in South Africa aimed to “make it obligatory for fire services to implement and maintain employee wellness programmes that will address the mental health needs of fire services staff in a professional manner” (South Africa. Department of Cooperative Governance 2020).

2.6.6.2 Chaplains

Chaplains are employed to offer spiritual care to employees in a particular work setting such as police, EMS or fire services (Joubert and Grobler 2013) and have been utilised for many years within South African public services to help employees deal with traumatic experiences (Van Wyk 2016). As they are often present on-site and develop relationships with the FRs, they are perceived to understand the nature of the work and the traumatic incidents to which the FRs are exposed (Joubert and Grobler 2013). Perceived advantages of utilising the service of chaplains include the lack of stigma associated with consulting a chaplain compared to consulting a psychologist and the need for a spiritual component that is not necessarily provided by an EAP (Van Wyk 2016).

2.6.6.3 Psychologists

Psychologists are professionals who, in South Africa, must be registered with the Health Professions Council of South Africa (Health Professions Council of South Africa [HPCSA] 2020). In her study of paramedics in South Africa, Schroder found that 57% of them had access to a psychologist (Schröder 2012), but it is not clear whether DMs and firefighters have similar access.

2.6.7 Spiritual interventions

Issues of meaning and purpose may be addressed by spiritually integrated interventions that assist with psychological recovery (Weber and Pargament 2014). A “Building Spiritual Strengths” intervention has been shown to reduce PTSD symptoms in military veterans (Harris et al. 2011). By incorporating R/S into their practice, social workers can assist religious clients with positive re-framing, and affirm positive religious coping strategies (Xu 2016). A majority of EAPs surveyed in South Africa were positive about incorporating R/S into their workplace practices (Van Wyk 2016).

In EMS in the USA, the use of religion as a coping strategy was associated with lower burnout levels (Boland et al. 2019) and a significant proportion of African-language speaking EMS in Gauteng were found to turn to religion as a coping mechanism (Naudé and Rothmann 2005). In her study of FRs in South Africa, Van Straten (2019) found that spirituality was a central part of the lives of FRs and she concluded that therapeutic interventions needed to include spirituality.

2.7 Conclusion

In conclusion, it can be seen that FRs throughout the world are exposed to traumatic and workplace stressors and because of this they have increased levels of psychopathology. Due to their high levels of CI exposure and chronic workplace stressors South African FRs are likely to be particularly adversely affected. However, a substantial proportion of FRs does not develop psychological abnormalities, thereby demonstrating high levels of psychological resilience. FRs, in general, are aware of R/S in their work and this is likely to be particularly the case in a South African context.

Many types of intervention have been undertaken to decrease the adverse effects of stress exposure in FRs. Creating a culture of mental health awareness with strong peer and supervisor support has proven to facilitate help-seeking and thus be protective against the development of psychopathology. Training courses directed towards these ends have proven to be the most effective. In addition, social support outside the workplace and exercise programmes seem to be protective factors. Ready access to professionals such as counsellors and psychologists will continue to be necessary for FRs for interventions to occur if symptoms do develop. In this context, spiritually integrated interventions may be underutilised at present.

Chapter 3

Research Methodology

3.1 Introduction

This chapter describes the research design that was used to answer the study's questions and fulfil its objectives. The research methodology explains in detail the process used in conducting the empirical research and its techniques, data collection methods and data analysis. The rationale for the data collection instrument used will be outlined and the methods used for data collection and analysis will be detailed. The ethical issues involved will also be discussed.

3.2 Aim and research questions

The aim of this study was to determine the levels of religiosity/spirituality amongst first responders in Region E and their association with work-related burnout and psychological resilience. The overarching research aim may be operationalised practically by the following broad research questions:

- 1) What are the levels of work-related burnout amongst FRs in Region E of the City of Johannesburg Metropolitan Municipality?
- 2) What are the associations between psychological resilience, levels of work-related burnout and R/S amongst this population?
- 3) What interventions for increasing resilience would be acceptable to this population?
 - a) Do the responders seek help from spiritual/religious sources?
 - b) Would they be prepared to attend training that included spiritual/religious content?

3.3 Research design

Research design may be defined as a strategic framework outlining a logical plan involving the topic to be studied, the study population, the research methods, the purpose of the study and how the researcher intends to conduct the research (Babbie 2007; Mouton 2001). Set within a positivist paradigm (Rehman and Alharthi 2016), this study adopted a quantitative approach. According to Goertz and Mahoney (2012), a quantitative approach is an objective, systematic investigation of a phenomenon or phenomena, by means of performing statistical techniques on numerical data which has been gathered. This quantitative approach describes and examines relationships and interactions between

variables (Muijs 2011). For this study, a non-experimental, cross-sectional research design (Flick 2011) was used. This type of design enables the observation of two or more variables at a given point in time to describe the relationships among or between those variables (Goertz and Mahoney 2012).

3.4 Study population and sampling

The City of Johannesburg employs 160 firefighters or EMS to work in Region E under the direction of the City of Johannesburg Emergency Management Services. They are based at fire stations in Lonehill, Sandton, Alexandra, Modderfontein and Northview. The City of Johannesburg Disaster Management Centre employs 24 DMs, who are allocated to specific regions, but are each given different portfolios covering the whole of the City of Johannesburg. The total population available for the study was thus 184. A 5% margin of error with a 95% confidence interval gives a sample size of 125 (Raosoft 2004).

Participants were selected to participate in this study by means of a purposive sampling method. Purposive sampling is used when participants must meet a specific criterion (Neuman 2000). The inclusion criteria for this study stipulated that the first responders should currently be employed by the City of Johannesburg. In addition, participants needed to be fluent in English and had to be honest in their responses.

3.5 Data collection: Questionnaire

In this study, three existing measurement scales were incorporated into one questionnaire (Appendix 1) along with demographic questions and some specific questions designed to elicit information around training and sources of help.

3.5.1 Demographic questions (questions 1-6)

Self-compiled biographical questions were used to create a profile of the study population. These questions covered basic demographics plus the length of time working in the field, as well as religious categories as used in the General Household Survey 2015 (Statistics South Africa 2015).

3.5.2 Copenhagen Burnout Inventory (questions 7, 16, 18, 20, 24, 26, 30)

The seven questions on work-related burnout from the Copenhagen Burnout Inventory (CBI) were used to determine the level of participant's work-related burnout, which is defined by the author as "the degree of physical and psychological fatigue and exhaustion that is perceived by the person as related to his/her work". As recommended by the author,

the questions of the CBI were dispersed throughout the questionnaire to prevent response bias. The CBI gives a percentage burnout score with higher scores indicating higher levels of burnout which are predictive of sick leave/absence days, sleeping difficulties, use of analgesic medication and desire to leave that occupation (Kristensen et al. 2005).

The CBI is a reliable measure of burnout both internationally (Papaefstathiou, Tsounis, Malliarou and Sarafis 2019; Sestili, Scalingi, Cianfanelli, et al. 2018) and in South Africa (Smit 2011). The CBI has also been used to assess burnout in paramedics in Johannesburg (Stassen et al. 2013). The latter defined burnout as being a CBI score of more than 50 and they found that 38% of respondents were experiencing burnout in the work-related category.

3.5.3 Brief Resilience Scale (questions 8, 10, 11, 13, 14, 15)

The Brief Resilience Scale (BRS) (Smith, Dalen Wiggins, et al. 2008) was used to measure the degree of resilience displayed by participants. This scale was chosen as it consists of only six questions, performs favourably in relation to other scales with more items (Windle, Bennett and Noyes, et al. 2011) and demonstrates high internal consistency (Pangallo, Zibarras, Lewis et al. 2015). Three of the items are positively worded, and three negatively worded in order to reduce response bias (Smith et al. 2008). A BRS score of less than 3 indicates low resilience, from 3.0–4.3 normal resilience and 4.31–5.0 high resilience. The BRS has been validated in various countries (Chmitorz, Wenzel, Stieglitz, et al. 2018; Kyriazos et al. 2018) although to the researcher's knowledge, it has not been used in a South African context.

3.5.4 Duke University Religion Index (questions 17, 19, 21–23)

The Duke University Religion Index (DUREL) was used to measure the level of religiosity/spirituality of participants (Koenig and Büssing 2010).

This five-item index measures R/S across three dimensions, namely Organised Religious Activity (ORA), Non-organisational religious activity (NORA) and Intrinsic religiosity (IR). The ORA scale asked the question "How often do you attend church or other religious meetings?" This was answered on a Likert scale with six options from "never" (scoring 1) to "more than once a week" (scoring 6). Similarly, the NORA scale asked the question "How often do you spend time in private religious activities, such as prayer, meditation or Bible study?". This was scored on a Likert scale from 1 "rarely or never" to 6 "more than once a day". Thus, a low score on these two scales indicates a low frequency of organised or non-organised religious activity respectively. The IR subscale of the DUREL measures the degree of personal motivation or commitment and therefore more closely aligns with the

concept of spirituality (Nelson et al. 2009) with a high score indicating higher spirituality. The DUREL has been validated for use in various countries (Koenig and Büssing 2010; Lucchetti, Granero Lucchetti, Peres et al. 2012) and has been used in South Africa (Cronjé, Sommers, Faulkner et al. 2017; Tomita and Ramlall 2018).

3.5.5 Additional questions (questions 9, 12, 25, 27–29, 31–33)

Additional questions were included in the questionnaire in order to determine what interventions for increasing resilience would be acceptable to this population and to ascertain what resources the respondents are already accessing.

3.6 Data collection: Procedure

The questionnaires were distributed to the first responders between 28 October and 20 November 2020. Conducting this study during a declared state of national disaster due to the COVID-19 pandemic (South Africa 2020) provided some challenges. The researcher was unable to give the survey to the participants herself as was originally envisaged. The regional director for Region E gave all the questionnaires to the station commanders to distribute to the firefighters or EMS during their shifts. It was therefore not possible to check that all the questions had been answered which led to more missing data points than would otherwise have been the case. A senior DM based at the head office in Johannesburg distributed the questionnaires to all 24 DMs. As with the firefighters/EMS, it was therefore not possible to check the questionnaires for missing answers or to follow up with respondents who had not returned the questionnaire. The questionnaires were completed by the FRs themselves by ticking the appropriate boxes.

3.7 Data analysis

The data obtained was coded as outlined below, entered into a Microsoft Excel spreadsheet and edited to ensure accuracy. The Cronbach's α coefficient was determined for each of the three scales used, the CBI, BRS and DUREL, to measure the reliability and validity of the questionnaires.

3.7.1 Data coding

The data was coded as follows:

3.7.1.1 Demographic questions (questions 1–6)

These were coded as nominal data for example question 1 male was coded as 1 and female as 2.

3.7.1.2 Copenhagen Burnout Inventory (questions 7, 16, 18, 20, 24, 26, 30)

These questions forming the CBI were scored as follows according to the protocol (Kristensen et al. 2005).

The first three questions:

Question 7: Is your work emotionally exhausting?

Question 16: Do you feel burnt out because of your work?

Question 18: Does your work frustrate you?

Were answered on a Likert scale and scored as follows:

To a very high degree: 100

To a high degree: 75

Somewhat: 50

To a low degree: 25

To a very low degree: 0

The next three questions:

Question 20: Do you feel worn out at the end of the working day?

Question 24: Are you exhausted in the morning at the thought of another day at work?

Question 26: Do you feel that every working hour is tiring for you?

Were answered on a Likert scale and scored as follows:

Always: 100

Often: 75

Sometimes: 50

Seldom: 25

Never/almost never: 0

For question 30: Do you have enough energy for family and friends during leisure time? The score above was reversed, so “always” had a score of 0, and “Never/almost never” a score of 100.

The total score on the scale is the average of the scores on the items; the scores were added and divided by seven to give a percentage work burnout score.

3.7.1.3 Brief Resilience Scale (questions 8, 10, 11, 13, 14, 15)

The six questions of the BRS were answered on a five-point Likert scale from “strongly disagree” to “strongly agree”. The questions were scored according to the protocol (Smith et al. 2008).

Three of the questions:

Question 8: I tend to bounce back quickly after hard times

Question 11: It does not take me long to recover from a stressful event

Question 14: I usually come through difficult times with little trouble

Were scored from “strongly disagree” =1 through to “strongly agree”=5

The remaining three questions were scored in reverse that is, “strongly disagree” =5; “strongly agree” =1. These questions were:

Question 10: I have a hard time making it through stressful events

Question 13: It is hard for me to snap back when something bad happens

Question 15: I tend to take a long time to get over setbacks in my life

The score from all six questions was summed and divided by six to give a resilience score.

3.7.1.4 Duke University Religion Index (questions 17, 19, 21–23)

These questions forming the DUREL are scored as follows (Koenig and Büssing 2010):

- ORA (subscale 1), Question 17, scored from 1(never) to 6 (more than once a week)
- NORA (subscale 2), Question 19, scored from 1 (rarely or never) to 6 (more than once a day)
- IR (subscale 3), Questions 21–23, each question was scored from 1 (definitely not true) to 5 (definitely true of me) and the three figures were summed to give a total IR score.

These three subscales were analysed separately as recommended (Koenig and Büssing 2010).

3.7.1.5 Additional questions (questions 9, 12, 25, 27–29, 31–33)

These were coded as nominal data.

3.7.2 Statistical analysis

Categorical variables were summarised as percentages, and numerical variables were summarised as means and percentiles using Microsoft Excel. The microdata was then imported into Stata 15.1 (Stata n.d.) and a series of multiple regression analyses were conducted. In the first regression series, the BRS score was the response or dependent variable, and in the second regression series, the CBI score was the dependent variable. Stepwise regressions were then run to automatically remove nonsignificant variables.

3.8 Ethical considerations

3.8.1 Ethical approval

Ethical approval for this study was obtained from the Ethics Committee of the Faculty of Agricultural Sciences, University of the Free State. The ethical clearance number was UFS-HSD2020/0659/2205 (Appendix 5).

3.8.2 Permission to collect data

Permission to collect data was obtained from the Acting Executive Head of the City of Johannesburg Emergency Management Services and the Acting Divisional Head of the City of Johannesburg Disaster Management Centre (Appendix 4).

3.8.3 Protection from harm

The risk of exposure to physical or psychological harm should be minimised in any research study (Leedy and Ormrod 2016). As the study was conducted during the COVID-19 pandemic, any social contact carried the risk of viral transmission. To mitigate this risk, questionnaires were given to the director of Johannesburg EMS to distribute to station commanders to give to their employees, and to a senior DM based at the head office in Johannesburg to distribute to all 24 DMs. Social distancing, mask and hand sanitising protocols (World Health Organization 2020) were observed by the researcher during her interactions with the senior staff.

Because the questions concerned stress and burnout, the possibility existed that the participants might feel stress or anxiety as a result of thinking about those issues. The consent form stated “It is possible that thinking about work-related stress may make you feel anxious or uncomfortable. You will be given a leaflet detailing resources that are available for you to access help and counselling if you would like.” An information leaflet

was given to all participants, informing them of the nature of work-related burnout and available psychological services in their area (Appendix 2).

3.8.4 Voluntary and informed participation

Participants in this study were informed about the voluntary nature of their participation. Each respondent signed a consent form (Appendix 3). This form detailed the nature and purpose of the study and what participation in it would involve. It also outlined the anonymity and confidentiality of individual responses and that the respondent was free to withdraw at any time during the process of answering the questions.

3.8.5 Privacy and anonymity

Given the potentially sensitive nature of the subject matter, it was essential that the respondents' privacy and anonymity were guaranteed. The only identifier on the questionnaire was the respondent number. The signed consent forms were kept separately from the questionnaires and the data was completely anonymous.

3.8.6 Accuracy of reporting

The responses obtained from the participants were entered accurately into the datasheet. The data was analysed statistically and no findings were altered, manipulated, or misrepresented.

3.8.7 Plagiarism

All sources used in this thesis were acknowledged using in-text citing and referencing.

3.9 Limitations and delimitations

The study population all worked within a defined geographical area within the Johannesburg Metropolitan Municipality. The results may therefore not be generalisable to FRs working elsewhere within the city or in other regions of South Africa. This study did not attempt to assign psychiatric diagnoses to the population in question. It was only intended to flag self-reported symptoms as an indicator of work-related burnout. It is also possible that conducting the study during the COVID-19 pandemic influenced the responses on the burnout scale.

3.10 Summary

To summarise, this was a quantitative study set within a positivist paradigm that involved firefighters or EMS and DMs in the City of Johannesburg self-completing a questionnaire.

The questionnaire incorporated three established scales: the CBI, BRS and DUREL plus demographic questions and questions around access to help and training.

The data was analysed using both descriptive and inferential statistics to answer the research questions and meet the objectives of the study.

Chapter 4

Data Analysis and Presentation of Results

4.1 Introduction

This chapter presents and analyses the data obtained from the questionnaires completed by the firefighters or EMS in region E and the DMs in the City of Johannesburg between 28 October and 20 November 2020.

4.2 Sample size

A total of 111 questionnaires were returned out of a total population of 184. Of the 24 DMs, questionnaires were returned by 15, giving a response rate of 62.5%. Reasons reportedly given for not completing the questionnaire included: “too busy”; “we have our own research department” and “we have done research for your department before and it wasn’t relevant”. Only 96 of the 160 firefighters or EMS employed by the City of Johannesburg Emergency Management Services and stationed in Region E, completed their questionnaires, giving a response rate of 60%. As the station commanders distributed the questionnaires, the researcher could not determine the reasons for the non-responders.

If all the respondents are taken together, the total population is 184, if we assume a response distribution of 50% and allow a 5.87% margin of error, the sample size of 111 gives a confidence level of 95% (Raosoft 2004). When the two populations are analysed separately the total population of firefighters is 160. Assuming a response distribution of 50% and a 5.33% margin of error, a sample size of 96 gives a confidence level of 90% (Raosoft 2004). For the total population of 24 DMs, assuming a response distribution of 50% and a 13.28% margin of error, a sample size of 15 gives a confidence level of 90% (Raosoft 2004). This margin of error is higher than ideal and is due to the small total population size of DMs.

4.3 Data analysis

The data obtained was coded as outlined in section 3.7, entered into a Microsoft Excel spreadsheet and edited to ensure accuracy. Categorical variables were summarised as percentages, and numerical variables were summarised as means and percentiles. The microdata was then imported into Stata 15.1 (Stata n.d.). All of the multiple variable indexes, that is, the CBI, BRS and IR scales, were calculated and only those responses with all component variables for any given index were entered into the analysis. Cronbach’s alpha was calculated for each of the three scales to determine their internal consistency and

therefore whether these scales are reliably measuring the construct they are designed to measure for this population. Cronbach's alpha is expressed as a number between 0 and 1, with acceptable values generally considered to be over 0.70 (Tavakol and Dennick 2011).

4.3.1 Cronbach's alpha for the Copenhagen Burnout Inventory

Cronbach's alpha was calculated for the CBI as shown in Table 4.1. The alpha value was found to be 0.78, confirming that the work-related portion of the CBI used in this questionnaire was reliably measuring that construct (Tavakol and Dennick 2011). This value is comparable to that found for the CBI in other studies. A Cronbach's alpha of 0.913 for the CBI was found in a study in South Africa on employees working in any organisation (Smit 2011) and 0.868 in an Italian study of university professors (Sestili et al. 2018).

Table 4.1: Calculation of Cronbach's alpha for the Copenhagen Burnout Inventory

<i>CBI Internal Correlations</i>							
	Q7	Q16	Q18	Q20	Q24	Q26	Q30
Q7	1.0000						
Q16	0.4745	1.0000					
Q18	0.4522	0.5926	1.0000				
Q20	0.0712	0.3053	0.2800	1.0000			
Q24	0.2216	0.4299	0.5167	0.3182	1.0000		
Q26	0.1115	0.4602	0.4481	0.2719	0.6931	1.0000	
Q30	0.1037	0.1625	0.0730	0.0803	0.2341	0.2721	1.0000

Cronbach's Alpha CBI:

- Alpha Q7 Q16 Q18 Q20 Q24 Q26 > Q30
- Test scale = mean (unstandardized items)
- Average interitem covariance: 246.4503
- Number of items in the scale 7

Scale reliability coefficient **0.7806**

4.3.2 Cronbach's alpha for the Brief Resilience Scale

Cronbach's alpha was calculated for the BRS as shown in Table 4.2. The alpha was calculated as 0.38, which is below the level of 0.6 suggested for psychological constructs (Tavakol and Dennick 2011). However, Cronbach's alpha has been criticised, as for the calculation to be valid, essential tau-equivalence is assumed (Dunn, Baguley and Brunsden 2014). In a German study using the BRS Cronbach's alpha was found to be 0.76 (Kunzler, Stalikas, Prassa et al. 2018) and 0.8 in a Greek study (Kyriazos et al. 2018). The wording of the questions could have been rather convoluted for the respondents for whom English is not their first language. For example, question 14, which showed a negative correlation with some other items, stated "I usually come through difficult times with little trouble", this

wording might have caused some confusion. It is possible that the BRS is not the best scale to use for a South African population. Thus, the results obtained from this portion of the questionnaire should be interpreted with caution.

Table 4.2: Calculation of Cronbach's alpha for the Brief Resilience Scale

<i>BRS Internal Correlations</i>						
	Q8	Q10	Q11	Q13	Q14	Q15
Q8	1.0000					
Q10	-0.1651	1.0000				
Q11	0.1357	0.2069	1.0000			
Q13	0.1350	0.2884	0.0408	1.0000		
Q14	0.1898	-0.0039	0.0627	-0.0935	1.0000	
Q15	0.0725	0.2884	0.2059	0.4174	0.0128	1.0000

Cronbach's Alpha BRS:

- Alpha Q8 Q10 Q11 Q13> Q14 Q15
- Test scale = mean (unstandardized items)
- Reversed item Q14
- Average interitem covariance: .1078712
- Number of items in the scale 6

Scale reliability coefficient **0.3808**

4.3.3 Cronbach's alpha for the Intrinsic Religiosity scale

Cronbach's alpha was calculated for the IR scale as shown in Table 4.3. The alpha was 0.74, confirming the internal consistency and hence reliability of the IR portion of the DUREL scale in this study.

Table 4.3: Calculation of Cronbach's alpha for the Intrinsic Religiosity scale

<i>IR internal correlations</i>			
	Q21	Q22	Q23
Q21	1.0000		
Q22	0.3861	1.0000	
Q23	0.5295	0.5442	1.0000

Cronbach's Alpha IR:

- Alpha Q21 Q22 Q23
- Test scale = mean (unstandardized items)
- Average interitem covariance: .696416
- Number of items in the scale 3

Scale reliability coefficient **0.7407**

4.3.4 Multiple regression analysis

A series of multiple regressions were conducted to determine what factors, if any, predicted the variation in resilience and burnout scores of the respondents. In the first regression series, the BRS score was the dependent or response variable, and in the second regression series, the CBI score was the dependent variable. The analytical framework initially identified 19 potential explanatory or independent variables; the results of these included many variables that did not explain any significant variance in the dependent variable. Stepwise regressions were then run to automatically remove these nonsignificant variables, with both probability for inclusion set at < 0.1 , and in some cases < 0.05 . While this technique has some potential issues (Altman and Andersen 1989), this particular data had a relatively small number of complete responses, and with 19 explanatory variables, the residual degrees of freedom was small. Therefore reducing the number of explanatory variables has the benefit of increasing the number of residual degrees of freedom. This technique was therefore felt to be justified in this case.

4.4 Demographics of the respondents

This section consisted of six questions covering basic demographics and the length of time working as a FR.

4.4.1 Gender

Overall, 66% of the respondents were male, 71% of the firefighters were male, but only 40% of the DMs were male (Figure 4.1).

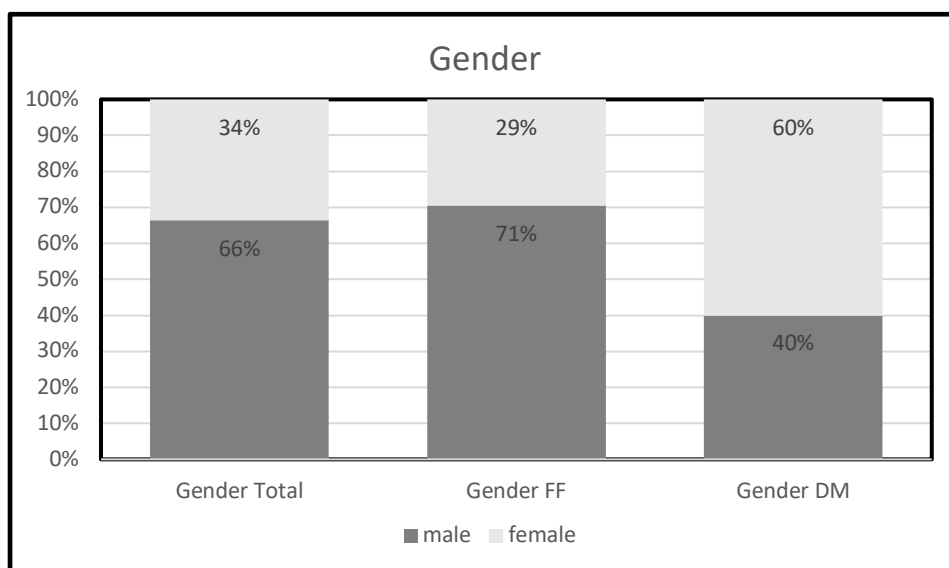


Figure 4.1: Gender of respondents

This figure is consistent with other research on FRs in South Africa in which 70% of paramedics were male (Stassen et al. 2013) and 63.6% of paramedic trainees were male (Fjeldheim et al. 2014). Traditionally firefighting and EMS have been considered to be a male occupation with 95% of firefighters and 75% of EMS in the USA being male (Schafer, Stutter and Gibbons 2015).

4.4.2 Age

The age distribution of the FRs is shown in Figure 4.2. All of the respondents were over 25 years old, with 73% of the firefighters being between the ages of 25 and 44. This is consistent with research internationally which shows that after the age of 45 there is a steep decline in the percentage of firefighters and EMS employed (Schafer et al. 2015). In contrast, 80% of the DMs surveyed were 45 years or older.

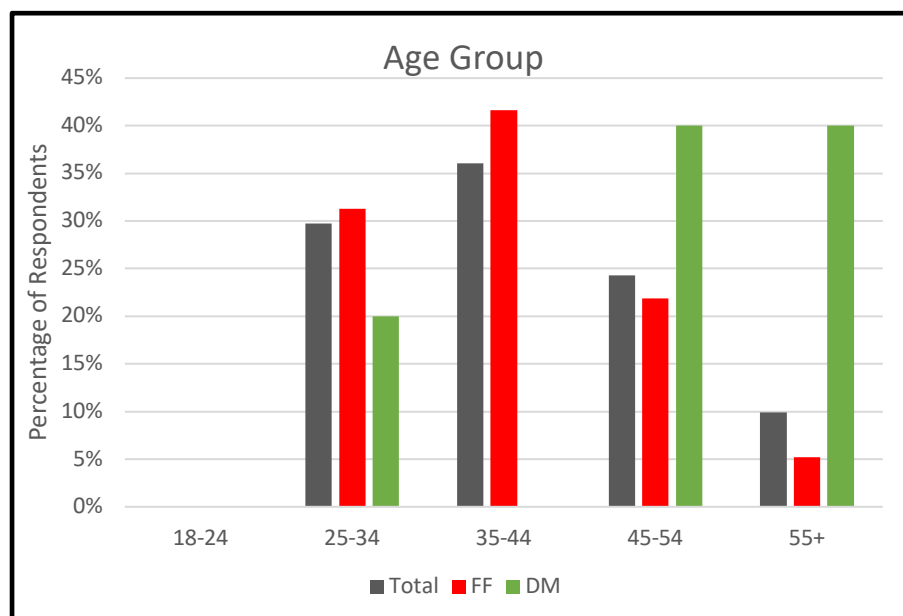


Figure 4.2: Age distribution of respondents

4.4.3 Race

The race distribution of the respondents is given in Table 4.4, with the vast majority, 88% overall, being black. This is in line with the population of Johannesburg Region E, of whom 87% are black (City of Johannesburg 2018).

Table 4.4: Race of respondents

Race	Total	Firefighter	Disaster Manager
Black	88%	88%	93%
White	7%	8%	0%
Coloured	1%	1%	0%
Asian	0%	0%	0%
Other	4%	3%	7%

4.4.4 Religion

Most of the respondents (81%) identified themselves as Christian (Figure 4.3) with 12% following “ancestral/ tribal/animist/other traditional African religion”. About 1% were Muslim, 3% indicated “nothing”, and 2% indicated “other” and “don’t know”. These findings are consistent with the 2015 Household Survey (Statistics South Africa 2015), in which 87% of the population of Gauteng Province identified themselves as Christian, however, in that survey, only 2.3% followed traditional religions compared with this finding of 12%.

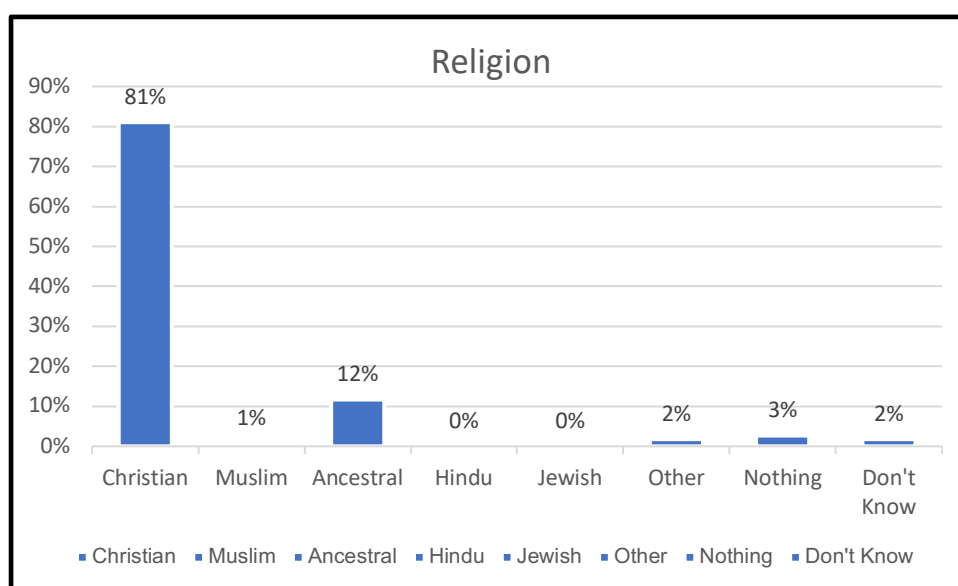


Figure 4.3: Religion of respondents

4.4.5 Length of time working as first responder

Figure 4.4 illustrates the length of time working as a FR.

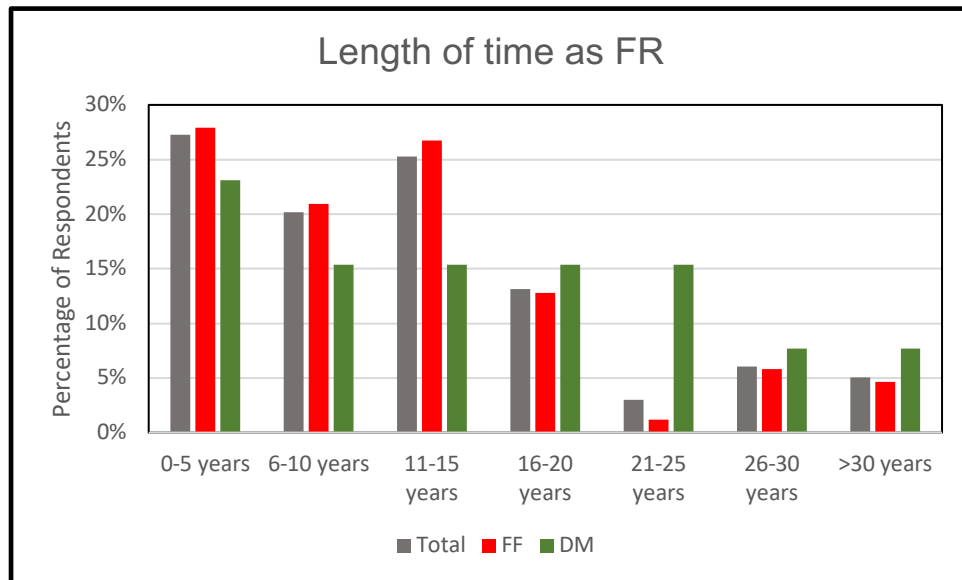


Figure 4.4: Length of time working as first responder

The mean length of time working in the profession for firefighters in this sample was 12 years and for the DMs was 15 years. This is comparable to the mean working years of 14.8 found in a large study of FRs in Florida (Miller and Unruh 2019).

4.5 Research question one

What are the levels of work-related burnout amongst first responders in Region E of the Johannesburg Metropolitan Municipality?

The first objective of this study was to measure the levels of work-related burnout in FRs employed in Region E of the City of Johannesburg. To do this, the seven questions on work-related burnout from the CBI were dispersed throughout the questionnaire. The scores from these questions were summed and divided by 7 to give a work burnout score, with the maximum possible score being 100. As shown in Table 4.1, Cronbach's alpha for the CBI in this study was 0.78 confirming the validity of this measure. Table 4.5 shows the count of the CBI questions with 91.89% of respondents completing the whole scale.

Table 4.5: The count of variables contributing to the Copenhagen Burnout Inventory

Copenhagen Burnout Inventory count check	Frequency	Percentage	Cumulative
3	1	0.90	0.90
6	8	7.21	8.11
7	102	91.89	100.00
Total	111	100.00	

The Kernel density and frequency distributions of the CBI for the respondents who answered all seven questions of the index are shown in Figure 4.5 alongside the normal distributions. The score fits a normal distribution and can therefore be used for more complex statistical analysis (Pearce and Frisbie 2010).

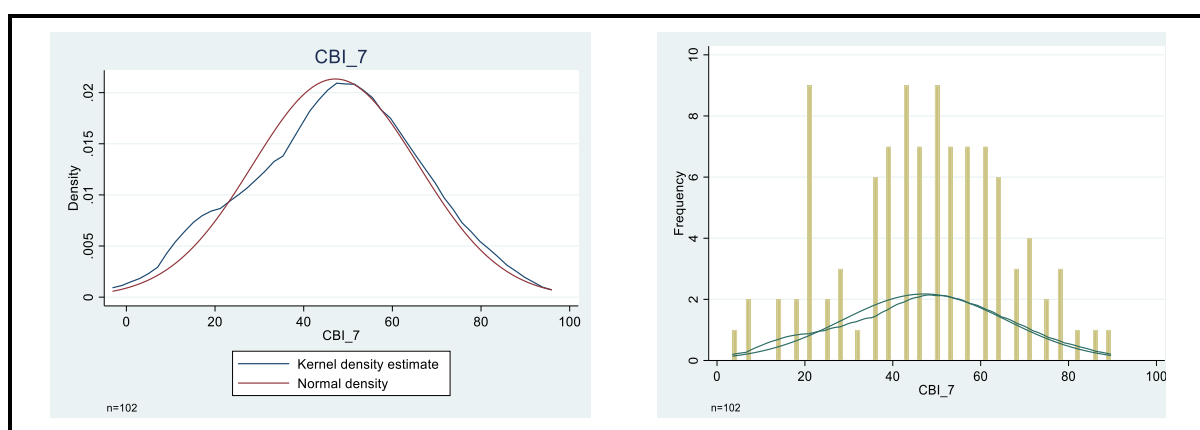


Figure 4.5: Kernel density and frequency distributions of Copenhagen Burnout Inventory for respondents answering all seven questions of the index

The mean CBI score across all the respondents was 46.3, with the mean for the firefighters or EMS being 47.2 and the DMs 40.7. In Kristensen et al.'s (2005) original study validating the CBI, she assessed scores across 15 occupations broadly within the caring professions. The average work-related burnout score was 33 across all the occupations, with midwives having the highest average score at 43.5. Thus, both FR groups in this study display overall high levels of work-related burnout.

Also, 39% of the respondents had CBI scores greater than 50, with 40% of the firefighters and 33% of the DMs having scored over 50 (Figure 4.6). These findings are consistent with a previous study of paramedics in Johannesburg which found that 38% were experiencing burnout in the work-related category, a score of more than 50 (Stassen et al. 2013).

This study demonstrates that it is possible to measure the levels of work-related burnout with the seven questions from the CBI and that 33% of the DMs and 40% of the firefighters were experiencing work-related burnout. Although the firefighters were all employed in Region E, the findings are consistent with studies elsewhere (Kristensen et al. 2005) and in South Africa (Stassen et al. 2013) and are therefore likely to be representative of Johannesburg as a whole.

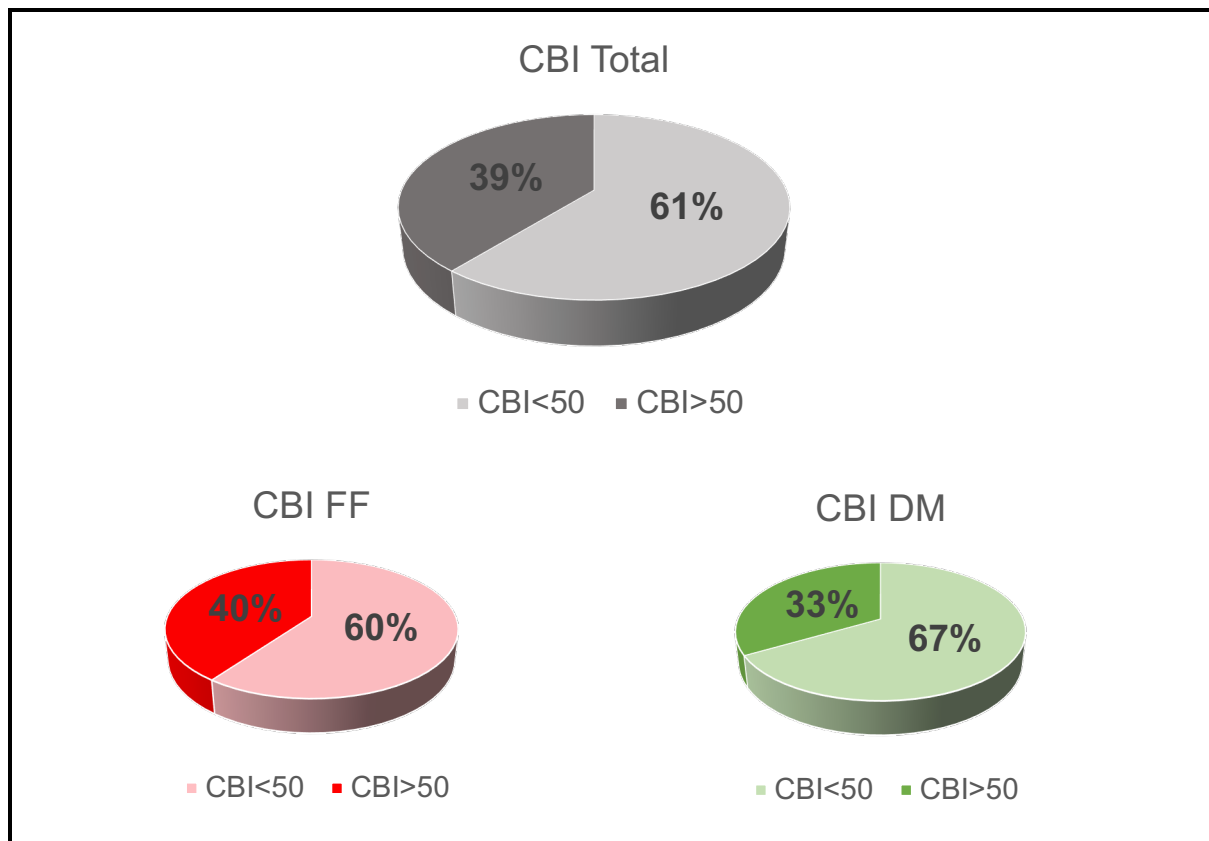


Figure 4.6: Percentage of first responders suffering from work-related burnout

4.6 Research question two

What are the associations between psychological resilience, levels of work-related burnout and R/S amongst this population?

Having established that there are significant levels of work-related burnout in this population, the second objective was to determine any association between psychological resilience, levels of work-related burnout and R/S in the study population.

To achieve this, the psychological resilience was measured using the BRS and the R/S using the DUREL.

4.6.1 Psychological resilience

The six questions from the BRS gave response scores from 1–5. These were added and the total divided by the number of questions answered, giving a maximum resilience score of 5 (Smith et al. 2008). Table 4.6 shows the count of the BRS questions with 93.69% of respondents completing the whole scale.

Table 4.6: *The count of variables contributing to the Brief Resilience Scale*

Brief Resilience Scale count check	Frequency	Percentage	Cumulative
0	1	0.90	0.90
4	1	0.90	1.80
5	5	4.50	6.30
6	104	93.69	100
Total	111	100	

Figure 4.7 illustrates the Kernel density and frequency distributions of the BRS for the respondents who answered all six questions of the scale, alongside the normal distributions. Although Cronbach's alpha was low, as discussed above, the score does fit a normal distribution and was therefore used for further analysis.

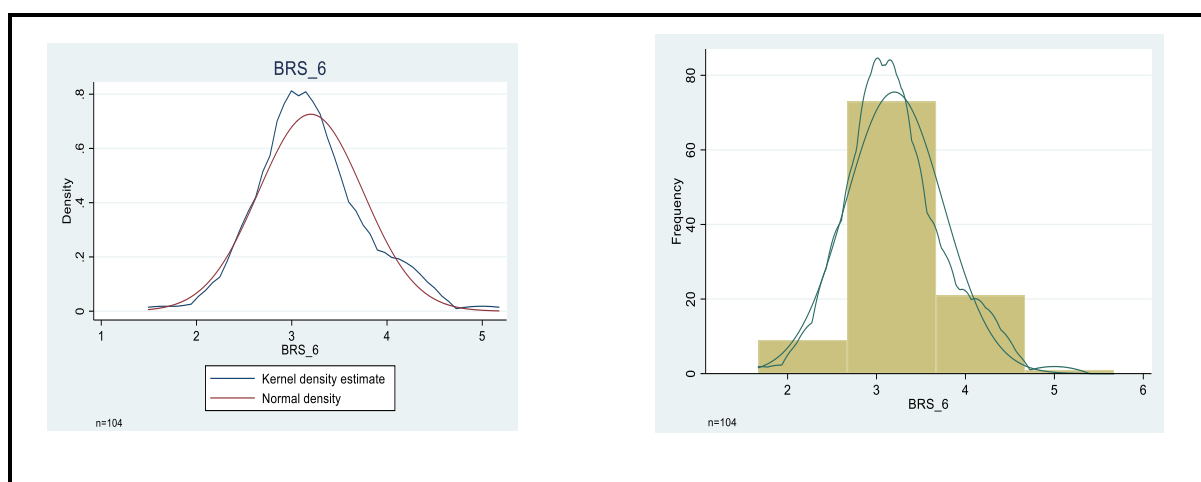


Figure 4.7: Kernel density and frequency distributions of Brief Resilience Scale for respondents answering all six questions of the index

The BRS score may be interpreted as shown in Table 4.7 (Smith, Epstein, Ortiz et al. 2013).

Table 4.7: Interpretation of Brief Resilience Scale score

Brief Resilience Scale score	Interpretation
1.00–2.99	Low resilience
3.00–4.30	Normal resilience
4.31–5.00	High resilience

The levels of resilience in the respondents are shown in Figure 4.8. A total of 40% of the DMs had low levels of resilience compared to only 25% of the firefighters.

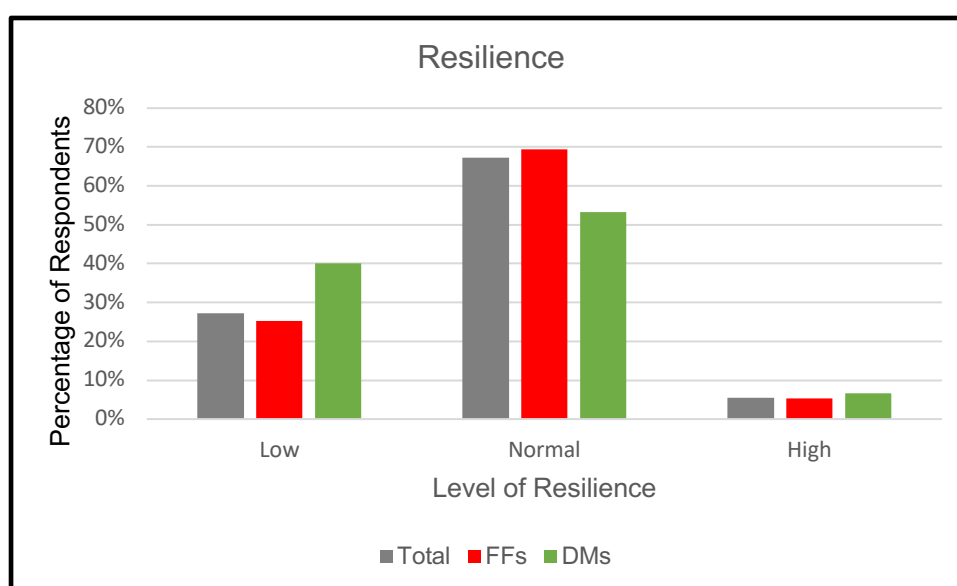


Figure 4.8: Levels of resilience

The mean resilience score for the total population of respondents was 3.20, with a mean of 3.22 for the firefighters or EMS and 3.04 for the DMs. This is slightly lower than the mean scores found in a general German population of 3.58 and 3.37 in two different samples (Chmitorz et al. 2018) and 3.35 in another German study (Kunzler et al. 2018) and that of 3.6 in a sample of healthy employees in the Netherlands (Soer, Six Dijkstra, Bieleman et al. 2019). It is also considerably lower than the mean BRS of 4.17 found for firefighters in the USA (Kaplan, Bergman, Christopher et al. 2017). However, it does fall within the range for normal resilience shown in Table 4.7 and is another indication of the validity of incorporating the BRS results into the analysis.

4.6.2 Religiosity/Spirituality

The results of the three DUREL subscales were analysed separately as recommended (Koenig and Büssing, 2010).

ORA: This question asked, “How often do you attend church or other religious meetings?” and was scored from 1 (never) to 6 (more than once a week).

NORA: This asked the question, “How often do you spend time in private religious activities such as prayer, meditation or Bible study?” and was scored from 1 (rarely or never) to 6 (more than once a day).

The results in Figure 4.9 show that 59% of the respondents attended church or another religious meeting a few times a month or more, while 33% spent time in private religious activities at least two or more times per week. Comparable figures for a general population in the USA are 65.9% for ORA and 69.2% for NORA (Koenig and Büssing 2010).

A total of 81% of the respondents identified as “Christian” and figures from the 2015 General Household Survey (Statistics South Africa 2015) indicated that 75% of Christians attended services a few times a month or more. This figure was 79.5% for Muslims, who comprised 1% of the study population and 43% for the Ancestral, tribal, animist or other traditional African religions who comprised 12% of the study population.

The figure for NORA, that is private religious activities such as Bible study or prayer, is relatively low compared with the attendance at religious meetings, which is high despite the potential difficulty of attending meetings while engaged in shift work or working weekends.

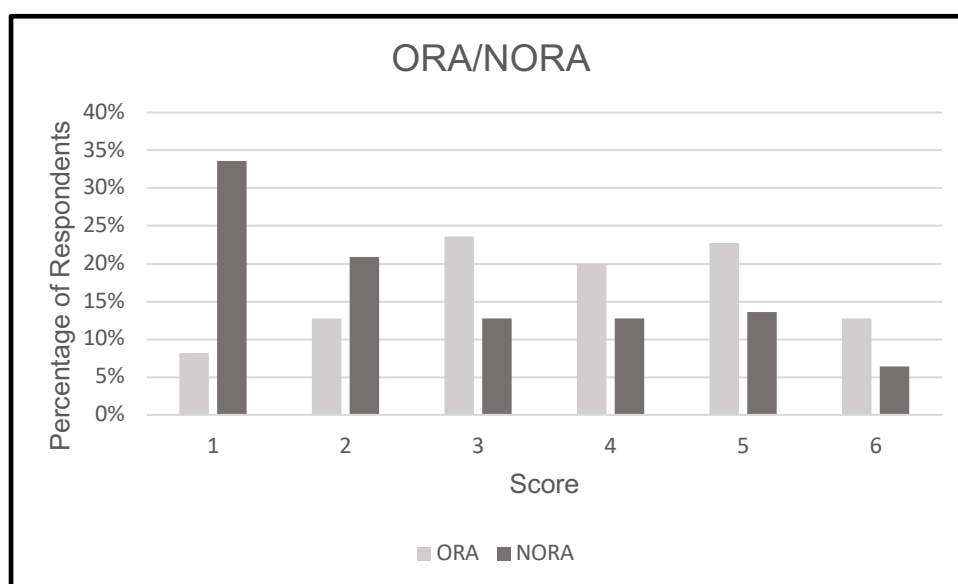


Figure 4.9: Scores for organised religious activity and non-organisational religious activity

IR: This subscale measuring intrinsic religiosity, which is akin to spirituality, comprises three statements:

- 1) In my life, I experience the presence of the Divine (that is, God).
- 2) My religious beliefs are what really lie behind my whole approach to life.
- 3) I try hard to carry my religion over into all other dealings in life.

Each is scored on a Likert scale from 1 (definitely not true) through to 5 (definitely true of me). The scores for the three statements are summed to give a total score for the scale between 3 and 15.

Table 4.8 illustrates the count of the IR questions with 97.3% of respondents completing the whole scale.

Table 4.8: *The count of variables contributing to the Intrinsic Religiosity score*

Intrinsic Religiosity count check	Frequency	Percentage	Cumulative
0	2	1.80	1.80
2	1	0.90	2.70
3	108	97.30	100.00
Total	111	100.00	

Figure 4.10 illustrates the Kernel density and frequency distributions of the IR for the respondents who answered all three questions of the index alongside the normal distributions. The distribution is skewed to the right for the respondents suggesting high levels of IR.

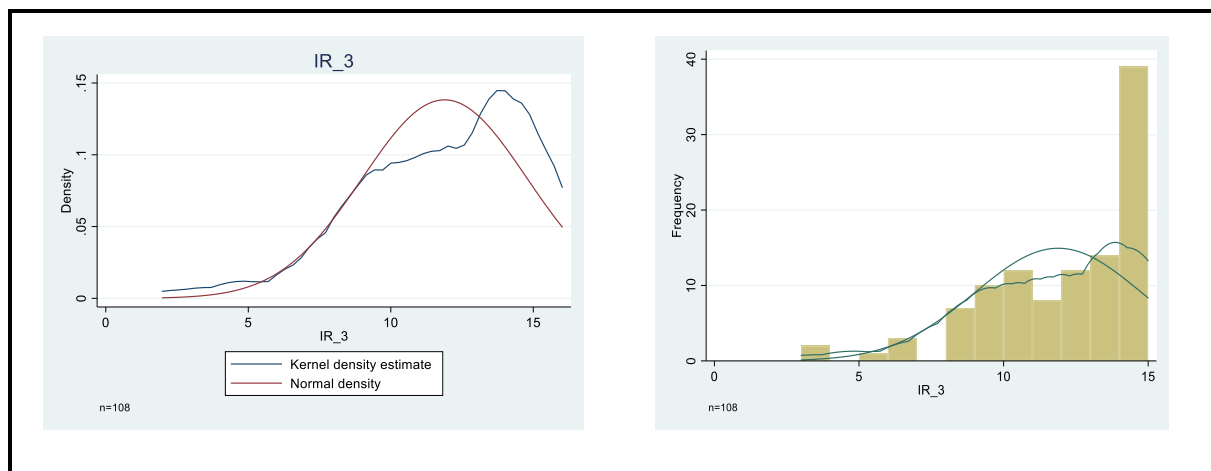


Figure 4.10: Kernel density and frequency distributions of intrinsic religiosity for respondents answering all three questions of the index

The results for the IR as a continuous score are shown in Figure 4.11. The scale may also be used categorically, with high intrinsic religiosity defined by a score on the IR scale of more than 10 (Stroppa and Moreira-Almeida 2013). A total of 71% of the respondents fell into this category. Also noteworthy is that 27% of respondents scored 15 out of 15 on the IR scale. These results affirm Nwoye's (2015) assertion that the overwhelming majority of the African population believe that God is involved in everyday life.

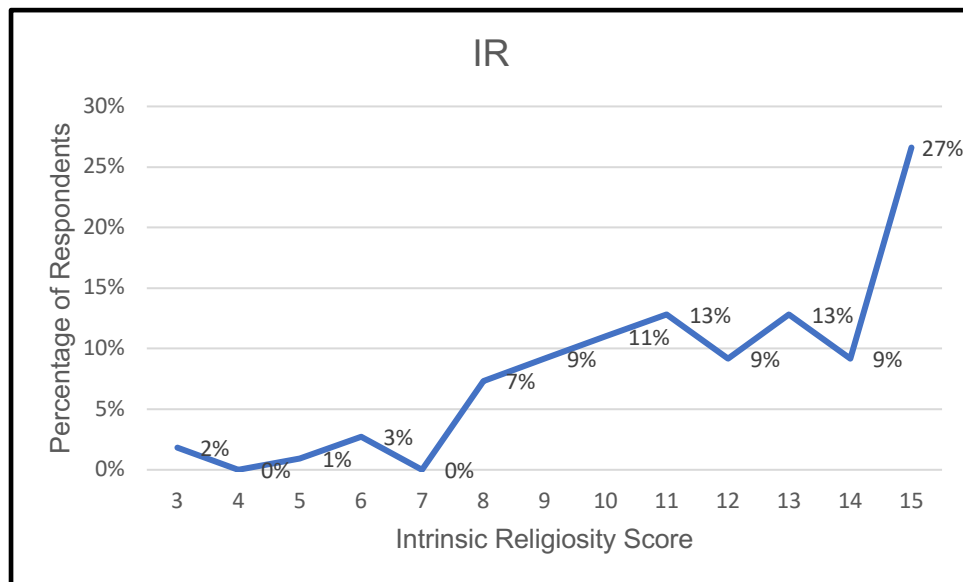


Figure 4.11: Scores for intrinsic religiosity

Having analysed the results of the demographics and the three scales separately, the second objective was to determine any association between psychological resilience, levels of work-related burnout and R/S in the study population. This was done by a series of multiple regression analyses.

4.6.3 Correlations between psychological resilience, levels of work-related burnout and religiosity/spirituality

Table 4.9 illustrates the correlations between the three measures for the firefighters who fully completed all three scales. Although none of the correlations was strong, there was a negative correlation between the resilience and burnout measures, which would be expected and has been found in another study of first responders (Miller and Unruh 2019). Also, there was a negative correlation between IR and burnout and a positive correlation with resilience suggesting that intrinsic religiosity or spirituality may be protective in his group.

Table 4.9: Correlations between the indices for the cohort of firefighters (N=79)

	Brief Resilience Scale	Intrinsic Religiosity	Copenhagen Burnout Inventory
Brief Resilience Scale	1.0000		
Intrinsic Religiosity	0.3228	1.0000	
Copenhagen Burnout Inventory	-0.1937	-0.2538	1.0000

The correlations between the three measures for the DMs who fully completed all three scales are shown in Table 4.10. Again, as expected, there was a negative correlation between burnout and resilience measures but no other significant results.

Table 4.10: Correlations between the indices for the cohort of disaster managers (N=15)

	Brief Resilience Scale	Intrinsic Religiosity	Copenhagen Burnout Inventory
Brief Resilience Scale	1.0000		
Intrinsic Religiosity	0.1695	1.0000	
Copenhagen Burnout Inventory	-0.4031	0.0076	1.0000

As the number of DMs was small compared to the firefighters/EMS and the results from the demographics and the three subscales were notably different for the two groups, the decision was taken to analyse the two groups separately.

In the first regression series, BRS was the dependent variable, and in the second regression series, CBI was the dependent variable. Stepwise regressions were then run to automatically remove nonsignificant variables.

4.6.3.1 Firefighters: Brief Resilience Scale as the dependent variable

Table 4.11 illustrates the multiple regression models that were used to determine the factors that predicted the BRS in the firefighters. The default respondent in the model is male, black and Christian.

Table 4.11: Multiple regression analysis: firefighters with Brief Resilience Scale as the dependent variable

Source	SS	df	MS
Model	9.43823788	19	.496749362
Residual	15.3040943	51	.30008028
Total	24.7423322	70	.353461888

Number of obs. 71
 F(19, 51) 1.66
 Prob>F 0.0778
 R-squared 0.3815
 Adj. R-squared 0.1510
 Root MSE .5478

BRS	Coeff.	Std. Err.	t	P> t	[95% conf. Interval]
Sex female	-.0304716	.2059663	-0.15	0.883	-.4439663 .383023
Age group	.009688	.1305943	0.07	0.941	-.252491 .271867
Race white	.6246391	.421944	1.48	0.145	-.2224488 1.471727
Race coloured	-.353835	.6608006	-0.54	0.595	-1.680484 .9727775
Race other	-.4367871	.4544931	-0.96	0.341	-1.34922 .4756458
Religion not Christian	.1582267	.1815735	0.87	0.388	-2.062974 .5227508
IR	.0700643	.0324922	2.16	0.036	.0048335 .1352951
CBI	-.0034017	.0042881	-0.79	0.431	-.0120104 .0052069
ORA	.054058	.0631682	0.86	0.396	-.0727575 .1808735
NORA	-.0750169	.0581509	-1.29	0.203	-.1917597 .0417259
Working Years	.0026859	.0189739	0.14	0.888	-.0354057 .0407776
Q9 happy to attend training	-.034489	.0686648	-0.50	0.618	-.1723392 .1033612
Q12 spiritual issues important in work	-.026776	.064767	-0.41	0.681	-.1568011 .1032492
Q25 attended training	.2258802	.2161468	1.05	0.301	-.2080525 .659813
Access to counsellor	-.2279043	.1779715	-1.28	0.206	-.5851969 .1293883
Access to Chaplain	-.1129019	.201494	-0.56	0.578	-.517418 .2916142
Access to EAP	.0487921	.1831223	0.27	0.791	-.3188413 .4164254
Talked to anyone	-.1248909	.1846679	-0.68	0.502	-.4956271 .2458453
Q33 would have liked to have consulted (binary)	-.2283917	.1758425	-1.30	0.200	-.5814103 .1246268
Constant	2.951375	.6199179	4.76	0.000	1.706838 4.195912

SS=sum-of-squares; df=degrees of freedom; MS=mean square; MSE= mean square error

The analysis was repeated with standardised coefficients that are regression coefficients obtained by first standardising all variables to have a mean of 0 and a standard deviation of 1 (Table 4.12).

Table 4.12: Multiple regression analysis: firefighters with Brief Resilience Scale as the dependent variable and standardised coefficients

Source	SS	df	MS
Model	9.43823788	19	.496749362
Residual	15.3040943	51	.30008028
Total	24.7423322	70	.353461888

Number of obs.	71
F(19, 51)	1.66
Prob>F	0.0778
R-squared	0.3815
Adj. R-squared	0.1510
Root MSE	.5478

BRS	Coeff.	Std. Err.	t	P> t	Beta
Sex female	-.0304716	.2059663	-0.15	0.883	-.0220276
Age group	.009688	.1305943	0.07	0.941	.0139762
Race white	.6246391	.421944	1.48	0.145	.2943147
Race coloured	-.353835	.6608006	-0.54	0.595	-.0706318
Race other	-.4367871	.4544931	-0.96	0.341	-.1224221
Religion not Christian	.1582267	.1815735	0.87	0.388	.1166016
IR	.0700643	.0324922	2.16	0.036	.3392107
CBI	-.0034017	.0042881	-0.79	0.431	-.1010308
ORA	.054058	.0631682	0.86	0.396	.1320105
NORA	-.0750169	.0581509	-1.29	0.203	-.1999159
Working Years	.0026859	.0189739	0.14	0.888	.035117
Q9 happy to attend training	-.034489	.0686648	-0.50	0.618	-.0685999
Q12 spiritual issues important in work	-.026776	.064767	-0.41	0.681	-.0526185
Q25 attended training	.2258802	.2161468	1.05	0.301	.1331048
Access to counsellor	-.2279043	.1779715	-1.28	0.206	-.1886758
Access to Chaplain	-.1129019	.201494	-0.56	0.578	-.0872864
Access to EAP	.0487921	.1831223	0.27	0.791	.0398192
Talked to anyone	-.1248909	.1846679	-0.68	0.502	-.1010486
Q33 would have liked to have consulted (binary)	-.2283917	.1758425	-1.30	0.200	-.193273
Constant	2.951375	.6199179	4.76	0.000	.

SS=sum-of-squares; df=degrees of freedom; MS=mean square; MSE= mean square error

The analytical framework initially identified 19 potential explanatory variables. The only explanatory variable that significantly explains variation in BRS is IR, $P=0.036$.

Stepwise regression was then run to remove nonsignificant variables (Table 4.13). The stepwise regression analysis identified five variables that were significant and that together accounted for 25% of the variability in the BRS (adjusted R -squared=0.2546). These variables will now be considered in turn:

1) Intrinsic religiosity

The IR score significantly correlated with the BRS score, $p=0.004$, (95% confidence interval 0.023–0.115). That is, the higher the intrinsic religiosity or spirituality, the higher

the resilience score. This suggests that those first responders who say they experience the presence of God in their lives, and whose beliefs influence their lives, show more psychological resilience and can recover from stressful events more quickly. This correlation of IR with resilience has been reported elsewhere, although in a different population (Mosqueiro, Da Rocha and Felck 2015).

Table 4.13: Stepwise regression analysis: firefighters with Brief Resilience Scale as the dependent variable

Begin with full model	
P 0.9412 >0.2000	removing age group
P 0.8883 >0.2000	removing sex female
P 0.7727 >0.2000	removing access to EAP
P 0.7065 >0.2000	removing working years
P 0.6488 >0.2000	removing Q12 spiritual issues important in work
P 0.6386 >0.2000	removing access to chaplain
P 0.6078 >0.2000	removing race coloured
P 0.5400 >0.2000	removing talked to anyone
P 0.3989 >0.2000	removing ORA
P 0.4342 >0.2000	removing religion not Christian
P 0.3361 >0.2000	removing race other
P 0.4017 >0.2000	removing CBI
P 0.2775 >0.2000	removing Q9 happy to attend training
P 0.2515 >0.2000	removing NORA

Source	SS	df	MS
Model	7.616846	5	1.5233692
Residual	17.1254862	65	.263469018
Total	24.7423322	70	.353461888

Number of obs.	71
F(5, 65)	5.78
Prob>F	0.0002
R-squared	0.3078
Adj. R-squared	0.2546
Root MSE	.51329

BRS	Coeff.	Std. Err.	t	P> t	[95% conf. Interval]
IR	.06889	.022912	3.01	0.004	.0231316 .1146484
Q33 would have liked to have consulted (binary)	-.3431094	.1229222	-2.79	0.007	-.588602 -.0976168
Race white	.5279599	.2338457	2.26	0.027	.0609377 .994982
Access to counsellor	-.2779262	.1345108	-2.07	0.043	-.5465628 -.0092895
Q25 attended training	.2829714	.1781893	1.59	0.117	-.0728972 .63884
constant	2.608925	.274639	9.50	0.000	2.060433 3.157417

SS=sum-of-squares; df=degrees of freedom; MS=mean square; MSE= mean square error

2) Question 33: would have liked to have consulted

This question stated, “In the past year, for a matter relating to my mental/emotional health/stress levels, I would have liked to have consulted (but was not able to)” and then asked the respondent to tick boxes by any of the 10 options they would have liked to consult. Box 11 was “none of the above”. In the analysis, a binary approach was used due to the relatively small amount of data, which means that if any of the ten boxes were ticked, this expressed an unmet need. This unmet need significantly negatively correlated with the BRS score $p=0.007$ (95% confidence interval -0.589– -0.098). That is, any need to have consulted someone in the past year about psychological issues, which was not met for any reason led to a significantly lower resilience score.

3) Race: white

This significantly correlated with higher resilience scores $p=0.027$ (95% confidence interval 0.061–0.995). One possible explanation for this correlation is that race-based inequalities in access to education and resources are still prevalent in South Africa (Amnesty International 2020), with white people more likely to be living in wealthier neighbourhoods with less violence and crime and more access to green spaces which are critical for people’s well-being (Venter, Shackleton, Van Standen et al. 2020). Thus, it could be surmised that black respondents may be more likely to be living in lower-income neighbourhoods that are subject to more violence and crime and may be more likely to be exposed to critical incidents outside of the workplace, and have fewer resources or opportunities available for exercise and other forms of relaxation which are known to decrease stress (Wild et al., 2020). More research is required to determine whether this explanation is correct.

4) Access to counsellor

Having access to a counsellor through work (question 27) was negatively correlated with the resilience score $p=0.043$ (95% confidence interval -0.547– -0.009). While at first, this seems counter-intuitive, a couple of possibilities for this finding are suggested. Firstly, in fire stations where employees are struggling with low resilience and high burnout, managers may be more likely to employ or emphasise access to a counsellor. Alternatively, respondents may be more aware that they have access to a counsellor in those stations where people are utilising the services of the counsellor more often, which is likely to be where exposure to CIs and burnout levels are high. Unfortunately, although space for location to be completed was present on the questionnaires this was not completed by a majority of respondents. Due to the COVID-19 lockdown, the completed questionnaires were returned to a central point before being returned to the

researcher, and it was therefore not possible to ascertain reliably which location a particular questionnaire was from. Analysis looking at differences between the fire stations was therefore unfortunately not possible.

5) Question 25: attended training

This stated, “In the past year I have attended training on stress management” with the answer options being “yes” or “no”.

Having attended training was positively correlated with higher resilience scores $p=0.117$ (95% Confidence interval -0.073–0.639). This finding is congruent with other research which has demonstrated positive effects of training programmes and psychoeducation (Mind 2016; Wild et al. 2020).

4.6.3.2 Disaster managers: Brief Resilience Scale as the dependent variable

Multiple regression models were used to determine factors that predicted the BRS in the DMs (Table 4.14). The default respondent in the regression model is male. All but one of the respondents was black and all but one was Christian; hence the alternatives of race and religion were eliminated.

Table 4.14: Multiple regression analysis: disaster managers with Brief Resilience Scale as the dependent variable

Source	SS	df	MS
Model	2.23522077	10	.223522077
Residual	.162470514	1	.162470514
Total	2.39769129	11	.217971935

Number of obs.	12
F(10, 1)	1.38
Prob>F	0.5861
R-squared	0.9322
Adj. R-squared	0.2546
Root MSE	.40308

BRS	Coeff.	Std. Err.	t	P> t	[95% conf. Interval]
Sex female	-.8744879	.9298676	-0.94	0.520	-12.68958 10.9406
Age group	-.4660423	.5387588	-0.87	0.546	-7.311622 6.379537
IR	-.1375102	.3719125	-0.37	0.775	-4.863106 4.588086
CBI	-.0289573	.0231541	-1.25	0.429	-.3231586 .2652439
ORA	.3647985	.1942861	1.88	0.312	-2.10384 2.833437
NORA	.1156783	.3207454	0.36	0.780	-.3959778 4.191135
Working years	.0345807	.0562379	0.61	0.649	-.6799902 .7491516
Q9 happy to attend training	.0919865	.8217646	0.11	0.929	-10.34952 10.5335
Q12 spiritual issues important in work	.3361984	.7172273	0.47	0.721	-8.777039 9.449436
Talked to anyone	-.090653	.4484485	-0.20	0.873	-5.788732 5.607426
Constant	4.310787	1.0039	4.29	0.416	-8.444975 17.06655

SS=sum-of-squares; df=degrees of freedom; MS=mean square; MSE= mean square error

The small number of complete respondents resulted in aliasing of different factors that happened to have the same profile as another one; the multiple regression analysis was therefore repeated with standardised coefficients (Table 4.15). Stepwise regression was then run to remove nonsignificant variables (Table 4.16). The stepwise regression analysis identified five variables that accounted for 64% of the variation in resilience scores for the DMs (adjusted R squared=0.64). These five variables were:

1) Copenhagen Burnout Inventory score

The burnout score correlated negatively with the resilience score $p=0.006$ (95% confidence interval -0.39 – -0.10), that is those DMs with low burnout scores have high resilience scores. The BRS was used in a study of more than 1 000 FRs (Miller and Unruh 2019) where it also showed a significant negative correlation with burnout scores.

Table 4.15: Multiple regression analysis: disaster managers with Brief Resilience Scale as the dependent variable and standardised coefficients

Source	SS	df	MS
Model	2.23522077	10	.223522077
Residual	.162470514	1	.162470514
Total	2.39769129	11	.217971935

Number of obs.	12
F(10, 1)	1.38
Prob>F	0.5861
R-squared	0.9322
Adj. R-squared	0.2546
Root MSE	.40308

BRS	Coeff.	Std. Err.	t	P> t	Beta
Sex female	-.8744879	.9298676	-0.94	0.520	-.9644963
Age group	-.4660423	.5387588	-0.87	0.546	-1.081693
IR	-.1375102	.3719125	-0.37	0.775	-.815123
CBI	-.0289573	.0231541	-1.25	0.429	-1.370413
ORA	.3647985	.1942861	1.88	0.312	.9689778
NORA	.1156783	.3207454	0.36	0.780	.413703
Working years	.0345807	.0562379	0.61	0.649	.7685271
Q9 happy to attend training	.0919865	.8217646	0.11	0.929	.1562342
Q12 spiritual issues important in work	.3361984	.7172273	0.47	0.721	.9211604
Talked to anyone	-.090653	.4484485	-0.20	0.873	-.0956027
Constant	4.310787	1.0039	4.29	0.416	.

SS=sum-of-squares; df=degrees of freedom; MS=mean square; MSE= mean square error

2) Female gender

Female gender correlates negatively with the BRS score $p=0.008$ (95% confidence interval -1.476 – $-.346$). That is, the female DMs had lower resilience scores. Of the studies using the BRS that have found a gender difference, females have scored lower

than males, but the results are inconsistent across studies (Chmitorz et al. 2018; Kyriazos et al. 2018). Gender differences for resilience scores were not found to be significantly different in the firefighter cohort in this study, but it is not clear whether this represents a real difference between the populations of firefighters and DMs as the number in the DM group was small. Further study is needed to clarify this issue.

3) Organised Religious Activity

This question asked, “How often do you attend church or other religious meetings?” and was answered on a scale from “never” to “more than once a week”. The ORA score significantly correlated with the BRS score $p=0.010$ (95% confidence interval .106-.527). This suggests that for the DMs, regular attendance at a religious meeting may be protective in terms of producing higher psychological resilience.

Table 4.16: Stepwise regression analysis: disaster managers with Brief Resilience Scale as the dependent variable

Source	SS	df	MS
Model	1.9261847	5	.385236941
Residual	.471506583	6	.07858443
Total	2.39769129	11	.217971935

Number of obs.	12
F(5, 6)	4.90
Prob>F	0.0393
R-squared	0.8033
Adj. R-squared	0.6395
Root MSE	.28033

Begin with full model
P 0.9290 > 0.1000 removing Q9
P 0.8347 > 0.1000 removing talked to anyone
P 0.3701 > 0.1000 removing NORA
P 0.1586 > 0.1000 removing working years
P 0.4057 > 0.1000 removing age group

BRS	Coeff.	Std. Err.	t	P> t	[95% conf. Interval]
Sex female	-.9108999	.2310433	-3.94	0.008	-1.476243 - .3455573
Q12 spiritual issues important in work	.4447264	.1479182	3.01	0.024	.0827835 .8066692
IR	-.1779862	.0632011	-2.82	0.031	-.3326337 -.0233387
CBI	-.0245445	.0059581	-4.12	0.006	-.0391233 -.0099656
ORA	.3165182	.0861871	3.67	0.010	.1056258 .5274105
Constant	3.769715	.5188045	7.27	0.000	2.500246 5.039184

SS=sum-of-squares; df=degrees of freedom; MS=mean square; MSE= mean square error

4) Question 12: addressing spiritual issues

This statement read, “It is important to address spiritual issues in this type of work” and was answered on a Likert scale from “strongly disagree” to “strongly agree”. There was

a positive correlation between the agreement that spiritual issues were important in work and resilience scores $p=0.024$ (95% confidence interval .083–.807). Again, for the DMs, it seems that recognition of a spiritual reality in everyday life is related to increased resilience.

5) Intrinsic Religiosity

IR was found to correlate negatively with the BRS $p=0.031$ (95% confidence interval -.333– -.023). This was surprising given the strong positive correlation of IR with BRS found for the firefighters. It was also surprising given the positive correlations for ORA and question 12, addressing spiritual issues in work, discussed above. The number in the DM sample was small and more studies are required to confirm or refute this finding.

4.6.3.3 Firefighters: Copenhagen Burnout Inventory as the dependent variable

Multiple regression models were used to determine the factors that predicted the CBI in the firefighters (Table 4.17). Stepwise regression was then run to remove nonsignificant variables (Table 4.18). This identified two variables whose correlation was significant at $p < 0.05$, these were IR which was negatively correlated with the burnout score, and having access to a chaplain which positively correlated. Three other variables fell just outside the $p < 0.05$ level and will also be discussed.

1) Intrinsic Religiosity

The IR score negatively correlated with the CBI score $p=0.009$ (95% confidence intervals -3.380– -.499). That is having a high internal religiosity or spirituality score correlated with having a low work-related burnout score. This finding was consistent with the analysis of the BRS for firefighters that showed a correlation of IR with high resilience scores.

Table 4.17: Multiple regression analysis: firefighters with Copenhagen Burnout Inventory as the dependent variable and standardised coefficients

Source	SS	df	MS
Model	5202.14843	19	273.797286
Residual	16622.6779	51	325.93486
Total	21824.8263	70	311.783233

Number of obs.	71
F(19, 51)	0.84
Prob>F	0.6520
R-squared	0.2384
Adj. R-squared	-0.0454
Root MSE	18.054

CBI	Coeff.	Std. Err.	t	P> t	Beta
Sex female	-1.335662	6.798181	-0.20	0.845	-.0325097
Age group	.7722986	4.257069	0.18	0.857	.0375132
Race white	3.692858	14.21481	0.26	0.796	.0585855
Race coloured	.2656914	21.95376	0.01	0.990	.0017858
Race other	-18.20925	15.39205	-1.18	0.242	-.1718411
Religion not Christian	-3.65175	6.037659	-0.60	0.548	-0.906089
BRS	-4.490674	4.531773	-0.99	0.326	-.1512016
IR	-1.994157	1.072982	-1.86	0.069	-.3250699
ORA	.2988781	2.030711	0.15	0.884	.0245746
NORA	.0100168	1.96399	0.01	0.996	.0008988
Working Years	.3955148	.6241564	0.63	0.529	.1741131
Q9 happy to attend training	.0494608	2.186248	0.02	0.982	.0033124
Q12 spiritual issues important in work	.0529098	2.081429	0.03	0.980	.0035009
Q25 attended training	-8.324501	7.11105	-1.17	0.247	-.1651652
Access to counsellor	1.647504	5.980296	0.28	0.784	.0459235
Access to Chaplain	7.617404	6.50691	1.17	0.247	.1982883
Access to EAP	-.7428748	6.043478	-0.12	0.903	-.0204129
Talked to anyone	1.228059	5.593554	0.22	0.827	.0334552
Q33 would have liked to have consulted (binary)	.9821149	1.392717	0.71	0.484	.1068458
Constant	72.99662	22.01246	3.32	0.002	.

SS=sum-of-squares; df=degrees of freedom; MS=mean square; MSE= mean square error

2) Access to a chaplain

Having access to a chaplain positively correlated with the CBI score $p=0.024$ (95% confidence interval 1.448–19.651). As is the case with having access to a counsellor correlating with lower resilience scores, this seems to be counter-intuitive. One possible explanation for this is that locations with a greater number of CIs, or where the employees have higher stress levels might be more likely to employ chaplains or to utilise their services more, thus the respondents might be more aware that they have access to a chaplain.

3) Working years

The number of years working as a first responder correlated with the work burnout score $p=0.058$ (95% confidence interval $-.017-.989$).

A review of the literature (Brooks et al. 2016) found several studies where longer tenure was associated with lower stress. Three studies showed higher morbidity with longer employment and four studies showed no association. Another review (Jones 2017) found similarly mixed results.

Table 4.18: Stepwise regression analysis: firefighters with Copenhagen Burnout Inventory as the dependent variable

Source	SS	df	MS
Model	4758.43171	5	951.686342
Residual	17066.3946	65	262.669916
Total	21824.8263	70	311.783233

Number of obs.	71
F(5, 65)	3.62
Prob>F	0.0059
R-squared	0.2180
Adj. R-squared	0.1579
Root MSE	16.204

CBI	Coeff.	Std. Err.	t	P> t	[95% conf. Interval]
Chaplain access	10.54993	4.557244	2.31	0.024	1.448482 19.65137
Working years	.485768	.2519598	1.93	0.058	-.0174305 .9889665
Q25 attended training	-10.36469	5.643258	-1.84	0.071	-21.63506 .9056749
Q33 would have liked to have consulted (binary)	7.286071	3.879503	1.88	0.065	-.4618311 15.03397
IR	-1.944033	.7233352	-2.69	0.009	-3.388633 -.4994326
Constant	55.83216	8.751995	6.38	0.000	38.35321 73.3111

SS=sum-of-squares; df=degrees of freedom; MS=mean square; MSE= mean square error

4) Question 33: would have liked to have consulted

This question stated, “In the past year, for a matter relating to my mental/emotional health/stress levels, I would have liked to have consulted (but was not able to)” and then asked the respondent to tick boxes by any of the 10 options they would have liked to have consulted. Box 11 was “none of the above”. In the analysis, a binary approach was used due to the relatively small amount of data, which means that if any of the ten boxes were ticked, this expressed an unmet need. This unmet need correlated with the CBI score $p=0.065$ (95% confidence interval $-.462-15.034$). This is consistent with the analysis of the BRS, which showed that having an unmet need to talk correlated with low resilience scores.

5) Question 25: attended training

This stated, “In the past year I have attended training on stress management” with the answer options being “yes” or “no”. This showed a negative correlation with the CBI score, that is those who had not attended training had higher burnout scores $p=0.071$ (95% confidence interval -21.635–.906). This corresponds to the analysis of the BRS for the firefighters, which found that having attended training on stress management correlated with higher resilience scores.

4.6.3.4 Disaster managers: Copenhagen Burnout Inventory as the dependent variable

Multiple regression models were used to determine the factors that predicted the CBI in the DMs (Table 4.19). Stepwise regression was then run to remove nonsignificant variables (Table 4.20).

Table 4.19: Multiple regression analysis: disaster managers with Copenhagen Burnout Inventory as the dependent variable and beta value for standardised coefficients shown in the last column

Source	SS	df	MS
Model	5251.87517	10	525.187517
Residual	118.191259	1	118.191259
Total	5370.06643	11	488.187857

Number of obs.	12
F(10, 1)	4.44
Prob>F	0.3546
R-squared	0.9780
Adj. R-squared	0.7579
Root MSE	10.872

CBI	Coeff.	Std. Err.	t	P> t	[95% conf.	Interval]	Beta
Sex female	-29.98115	16.92473	-1.77	0.327	-245.0302	185.0679	-.6987178
Age group	-5.73579	18.3373	-0.31	0.807	-238.7332	227.2616	-.2813058
IR	-7.747566	7.372428	-1.05	0.484	-101.4231	85.92801	-.9704215
BRS	-21.06538	16.84378	-1.25	0.429	-235.0858	192.9551	-.4451189
ORA	8.628025	7.058757	1.22	0.437	-81.06198	98.31803	.4842604
NORA	1.870695	9.004146	0.21	0.870	-112.5378	116.2792	.1413665
Working years	.1935515	1.770087	0.11	0.931	-22.29754	22.68464	.0908926
Q9 happy to attend training	12.66928	18.35479	0.69	0.615	-220.5505	245.889	.4546847
Q12 spiritual issues important in work	16.33757	13.76685	1.19	0.446	-158.5869	191.262	.9458753
Talked to anyone	-4.304324	11.56496	-0.37	0.773	-151.2511	142.6424	-.0959179
Constant	98.35078	67.66559	1.45	0.384	-761.4221	958.1237	

SS=sum-of-squares; df=degrees of freedom; MS=mean square; MSE= mean square error;

The stepwise regression analysis identified six variables that were significant at $p < 0.05$, these six variables accounting for 90.6% of the variation in the CBI score (adjusted R-squared=0.906). These variables were:

1) Internal religiosity/spirituality

The IR score negatively correlated with the CBI score, that is, the higher the spirituality score, the lower the burnout score $p=0.001$ (95% confidence interval -12.54– -5.34).

This correlation is the same as that for the firefighters who also showed a significant negative correlation of IR with burnout levels.

2) Question 12: addressing spiritual issues

This statement read, “It is important to address spiritual issues in this type of work” and was answered on a Likert scale from “strongly disagree” to “strongly agree”. There was a positive correlation between agreeing with this statement and the CBI score $p=0.001$ (95% confidence interval 11.76–24.22). For the DMs, there was also a positive correlation for question 12 with the BRS score. It is not clear why this should be the case and it may be that the numbers in this cohort are too small for meaningful analysis.

Table 4.20: Stepwise regression analysis: disaster managers with Copenhagen Burnout Inventory as the dependent variable

Source	SS	df	MS
Model	5140.71686	6	856.786144
Residual	229.349561	5	45.8699122
Total	5370.06643	11	488.187857

Number of obs.	12
F(6, 5)	18.68
Prob>F	0.0028
R-squared	0.9573
Adj. R-squared	0.9060
Root MSE	6.7727

Begin with full model
P 0.9037 > 0.1000 removing working years
P 0.8263 > 0.1000 removing NORA
P 0.4095 > 0.1000 removing age group
P 0.2621 > 0.1000 removing talked to anyone

CBI	Coeff.	Std. Err.	t	P> t	[95% conf. Interval]
Sex female	-32.09876	5.27502	-6.09	0.002	-45.65863 -18.53889
Q9 happy to attend training	12.55241	4.55144	2.76	0.040	.8525638 24.25226
IR	-8.939688	1.39988	-6.39	0.001	-12.53819 -5.341187
BRS	-17.54503	6.792349	-2.58	0.049	-35.00532 -.0847417
ORA	7.554251	2.490723	3.03	0.029	1.151645 13.95686
Q12 spiritual issues important in work	17.99221	2.423737	7.42	0.001	11.76179 24.22262
Constant	87.14059	21.87921	3.98	0.011	30.8983 143.3829

SS=sum-of-squares; df=degrees of freedom; MS=mean square; MSE= mean square error

3) Female gender

Female gender negatively correlated with the CBI score, which means that the female DMs had lower burnout scores $p=0.002$ (95% confidence interval -45.66– -18.54). In this group, female gender also negatively correlated with the BRS scores. It is not clear why this should be the case and further studies are required.

4) Organised Religious Activity

This question asked, “How often do you attend church or other religious meetings?” and was answered on a scale from “never” to “more than once a week”. The ORA scale significantly correlated with the CBI, $p=0.029$ (95% confidence interval 1.15–13.96). That is, among the DMs, those who attended religious meetings more frequently had higher burnout scores, although they were also found to have higher resilience scores. Again, this might be a function of the small sample size.

5) Question 9: willingness to attend training

This stated, “I would be happy to attend a training course to help me deal with stress that included looking at spiritual issues” and was answered on a five-point Likert scale from strongly disagree to strongly agree. Being willing to attend this type of training was positively correlated with the CBI score, $p=0.04$ (95% confidence interval .85–24.25). This suggests the possibility that those who are scoring high on burnout recognise both the value of training courses around stress and the importance of spiritual issues in work (question 12).

6) Brief Resilience Scale

The CBI correlated negatively with the BRS, $p=0.049$ (95% confidence interval -35.00– -.08). This result is to be expected as those with higher burnout scores might be anticipated to have lower resilience scores.

4.7 Research question three

Several questions in the questionnaire were designed to determine the resources that were available to the FRs and were already utilised, as well as those that the respondents had not been able to access. The study also attempted to answer the following questions:

What interventions for increasing resilience would be acceptable to this population?

- a) Do the responders seek help from spiritual or religious sources?
- b) Would they be prepared to attend training that included spiritual or religious content?

4.7.1 Current resources

4.7.1.1 Stress management training

Question 25 asked, “In the past year I have attended training on stress management”, with the option to answer “yes” or “no”. Figure 4.12 shows the results, with the vast majority of both firefighters and DMs not having attended any training on stress management within the previous year. A large study of FRs in Florida found that 72.7% had attended some form of training around stress although not necessarily within the previous year (Miller and Unruh 2019).

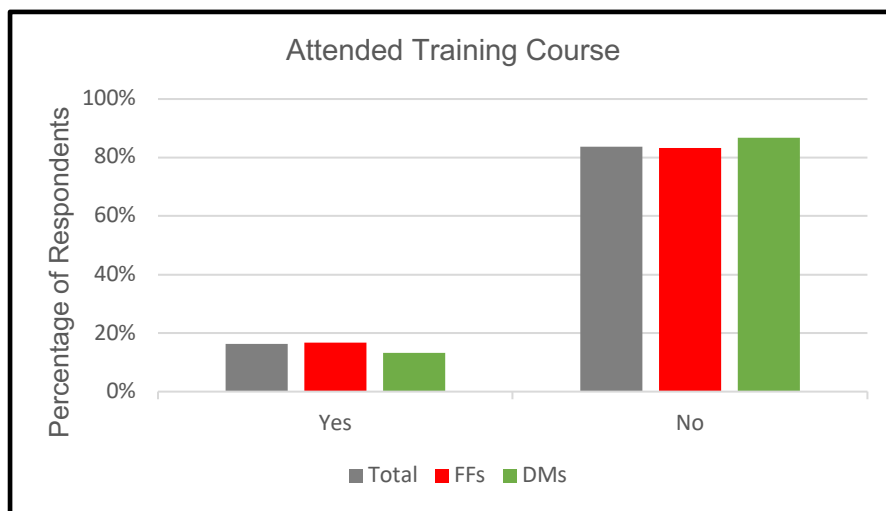


Figure 4.12: Percentage having attended a training course on stress management

The stepwise regression analysis for the firefighters found that having attended training was positively correlated with higher resilience scores $p=0.117$ (95% confidence interval -0.073-0.639), and those who had not attended training had higher burnout scores $p=0.071$ (95% confidence interval -21.635-.906). These correlations were not found for the DMs, but the number in that cohort was small and further studies are required.

4.7.1.2 Access to professional help

Questions 27 to 29 asked, “Through my work, I have access to a counsellor, chaplain, EAP with options to answer “yes” or “no” for each. Table 4.21 illustrates the results showing the percentage of respondents who did have access to each professional. In total and for both groups separately, a higher percentage had access to a chaplain, 64% in total, than an EAP, 58% in total. With 41% of firefighters but only 14% of DMs having access to a counsellor.

Table 4.21: Percentage of respondents having access to professional help at work

Professional	Total	Firefighter	Disaster Manager
Counsellor	37%	41%	14%
Chaplain	64%	67%	43%
Employee Assistance Programme	58%	61%	36%

For the firefighters, having access to a counsellor through work (question 27) was negatively correlated with the resilience score $p=0.043$ (95% confidence interval -0.547– -0.009). Having access to a chaplain positively correlated with the CBI score $p=0.024$ (95% confidence interval 1.448–19.651). As discussed, these findings may be because fire stations where there are higher stress levels are more likely to utilise the services of chaplains and counsellors therefore the respondents may be more aware that these services are available.

4.7.1.3 Sources of support

Question 32 asked whom the respondent had talked to about their mental or emotional health or stress levels due to work. Overall 58% of the respondents indicated that they had talked to someone in the past year about their mental or emotional health or stress. The left column in Table 4.22 shows the percentage of respondents who talked to each of the various categories of people available for support.

Table 4.22: Category of person consulted or whom they would like to consult

Person consulted	Percentage of all respondents	Person they would have liked to consult but could not	Percentage of all respondents
Friend or family member	33%	Psychologist	23%
Colleague	25%	Counsellor	16%
Doctor	16%	Employee Assistance Programme	15%
Supervisor	15%	Chaplain	13%
Chaplain	14%	Friend or family member	11%
Employee Assistance Programme	12%	Doctor	8%
Psychologist	10%	Supervisor	7%
Pastor/religious leader	8%	Pastor/religious leader	6%
Counsellor	5%	Other Professional	6%
Other Professional	3%	Colleague	5%

Of the 43 respondents who had CBI scores greater than 50, and who therefore could be suffering from work-related burnout, 27 of them or 63% had talked to someone in the last year. Of the 16 respondents who had high CBI scores but had not talked to anyone, three of them or 19% indicated that they would have liked to have consulted someone. The remaining 81% (13 respondents) indicated that they had not wished to consult anyone. This group is of concern as they have high CBI levels, but they are not seeking help and may therefore not be aware that they are at high risk for psychological sequelae. This group comprises 11.8% of the total respondents and should be targeted for intervention.

One third of the respondents indicated that they had talked to a friend or family member in the past year; this was the most frequently consulted group, followed by colleagues at 25%. This corresponds to findings in Canadian paramedics (Donnelly et al. 2016) who rated friend, family member or work partner as the most preferred group to talk to, followed by a co-worker, EAP, or a therapist.

A total of 15% of respondents talked to a supervisor which is similar to the finding of 17% in the Canadian paramedics (Donnelly et al. 2016). In terms of professionals, 16% consulted a doctor, 14% a chaplain, 12% an EAP and 10% a psychologist.

Question 33 asked whom they would like to have consulted about their mental or emotional health or stress in the last year, but were not able to. The results are on the right side of Table 4.22. A total of 23% of respondents stated they would like to have consulted a psychologist but were not able to. This suggests that the respondents are aware of the effects of their work on their psychological well-being but are not able to access the resources they feel they need.

For the firefighters, any unmet need to talk to someone, significantly negatively correlated with the BRS score $p=0.007$ (95% confidence interval -0.589– -0.098). That is, any need to consult someone in the past year about psychological issues that was not met for any reason, led to a significantly lower resilience score. This unmet need also positively correlated with the CBI score $p=0.065$ (95% confidence interval -462–15.034). This is consistent with the finding for firefighters in Florida that those who regularly spoke with co-workers had lower levels of burnout than those who did not (Miller and Unruh 2019).

Within the cohort of firefighters, there are therefore two distinct groups with high burnout levels, who might benefit from intervention. First is the group who recognises that they need to talk to someone but are not accessing that help. The second group is those who have not recognised their high burnout levels or are not articulating that they need assistance.

4.7.2 Spirituality

Question nine asked whether the respondents “would be happy to attend a training course to help me deal with stress that included looking at spiritual issues”. The answers were on a Likert scale from “strongly disagree” to “strongly agree”. The answers are shown in Figure 4.13, with 80% being either neutral or agreeing or strongly agreeing that they would be happy to attend such a course.

For the DMs, being willing to attend this type of training was positively correlated with the CBI score, $p=0.04$ (95% confidence interval .85–24.25). That is, those DMs who had higher burnout scores were more likely to agree to attend stress management training that included spiritual issues.

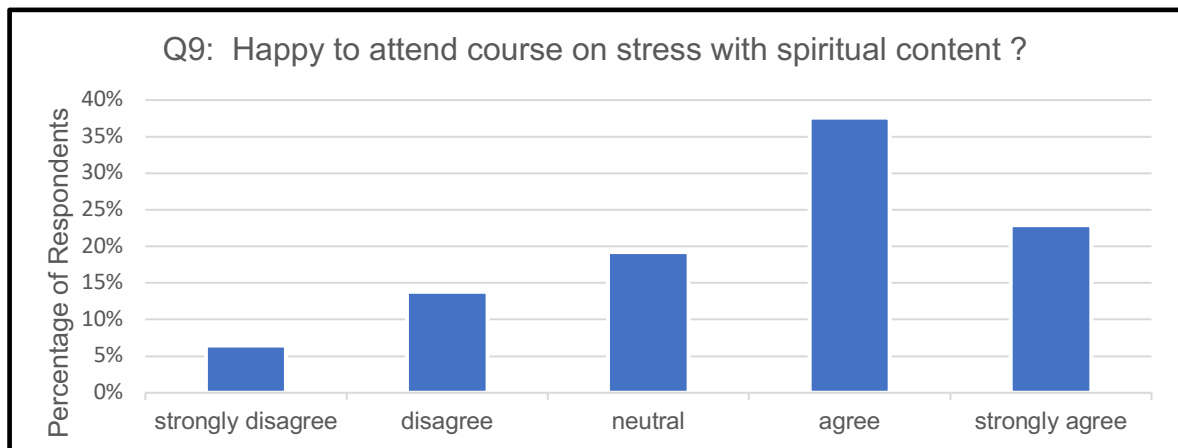


Figure 4.13: Willingness to attend a course on stress with spiritual content

Question 12 stated, “It is important to address spiritual issues in this type of work” with the respondents being asked to answer on a Likert scale from “strongly disagree” to “strongly agree”. The results are shown in Figure 4.14 with 18% disagreeing or strongly disagreeing that spiritual issues were important.

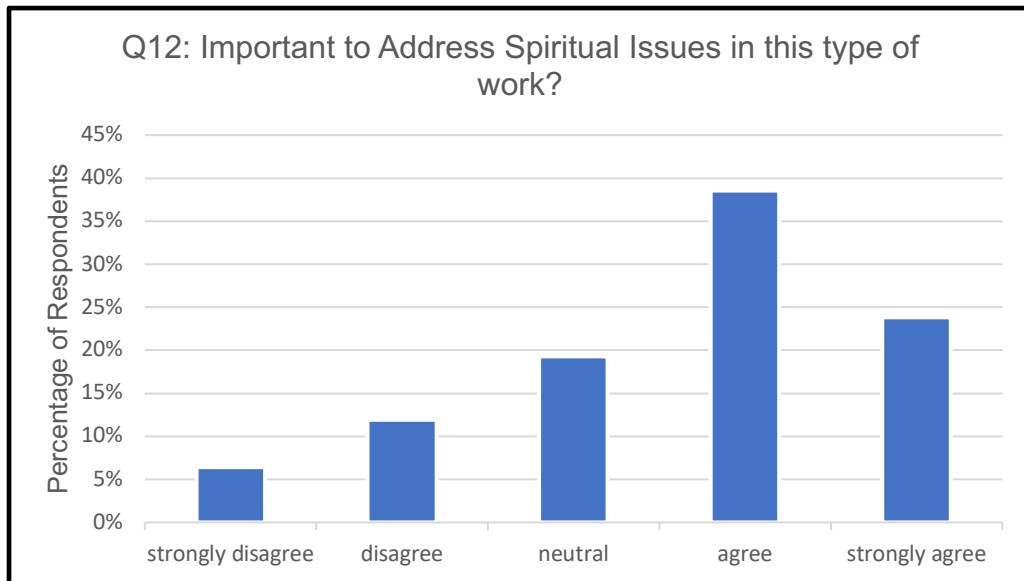


Figure 4.14: The importance of spiritual issues in this type of work

For the DMs, there was a positive correlation between the agreement that spiritual issues were important in work and resilience scores $p=0.024$ (95% confidence interval .083–.807). There was also a positive correlation between agreeing with this statement and the CBI score $p=0.001$ (95% confidence interval 11.76–24.22) for the DMs. As discussed above, it is not clear why this should be the case and may be due to the small number of DMs in the analysis.

4.8 Summary of results

This study was designed to answer three questions and to fulfil three objectives. The results as they pertain to answering these questions and meeting these objectives will be summarised in this section.

4.8.1 Research question one

This question asked, “What are the levels of work-related burnout amongst first responders in Region E of the Johannesburg Metropolitan Municipality?”. The objective was to measure the levels of work-related burnout.

To meet this objective, the seven questions on work-related burnout from the CBI were used (Kristensen et al. 2005). For this study, Cronbach’s alpha for the CBI scale used was 0.78, confirming the reliability of this scale in this population. A total of 40% of the firefighters and 33% of the DMs had scores greater than 50, which suggests work-related burnout, and is consistent with previous studies (Kristensen et al. 2005; Stassen et al. 2013). The mean CBI score for the firefighters was 47.2, and the DMs 40.7 which are high compared with the

means found in other caring professions (Kristensen et al. 2005). It is possible that conducting this study during the COVID-19 pandemic led to higher mean scores than would otherwise have been obtained, however, the percentage of respondents with burnout scores greater than 50 is similar to previous findings in Johannesburg (Stassen et al. 2013) suggesting that the high scores are not solely a result of the pandemic.

4.8.2 Research question two

This question asked, “What are the associations between psychological resilience, levels of work-related burnout and religiosity/spirituality amongst this population?” The objective was to determine the association between psychological resilience, levels of work-related burnout and R/S in the study population.

The psychological resilience of the first responders was measured using the BRS (Smith et al. 2008) and R/S using the DUREL (Koenig and Büssing 2010). The mean resilience score for both groups fell within the range of normal although it was slightly lower than that found in other populations (Smith et al. 2013). The DUREL is composed of three subscales, which were analysed separately. The results of the ORA found that 59% of the respondents attended church or another religious meeting a few times a month or more. In terms of NORA, 33% spent time in private religious activities at least two or more times per week. In contrast, 71% of respondents showed high intrinsic religiosity on the IR scale, with 27% of respondents obtaining the maximum score.

For both groups, the CBI and BRS demonstrated a negative correlation which is not surprising and has been found elsewhere (Miller and Unruh 2019). That is, a higher burnout score is associated with a lower resilience score. For the firefighters, the IR score significantly correlated with the BRS score, $p=0.004$, and negatively correlated with the CBI score $p=0.009$. Neither ORA nor NORA significantly predicted the CBI or BRS scores. Thus for the firefighters, high intrinsic religiosity or spirituality predicts higher resilience and lower burnout levels. For the DMs, the ORA score significantly correlated with the BRS score ($p=0.010$) and significantly correlated with the CBI ($p=0.029$). That is, those who attended religious meetings more frequently were more likely to have higher resilience scores and were more likely to have higher burnout scores. This study was not designed to look at causality, only correlation.

As previously found in EMS in Gauteng, it is possible that people who experience stress or burnout, attend religious meetings as a coping mechanism (Naudé and Rothmann 2005). However, it is also possible, as some studies have found (Weber and Pargament 2014; Xu 2016), that religion is harming psychological health, thus increasing burnout scores. There

may also be a sub-group who have higher resilience scores as they are benefitting psychologically from their religious attendance.

For the DMs, the IR score negatively correlated with both the CBI score and the BRS score. That is, the higher the spirituality score, the more likely it is that the burnout score is lower ($p=0.001$) and the more likely it is that the resilience score is lower ($p=0.031$). It is difficult to explain this finding and more studies are needed with larger numbers of DMs to determine cause and effect.

4.8.3 Research question three

This question asked, “What interventions for increasing resilience would be acceptable to this population?” With two sub-questions: “Do the responders seek help from spiritual/religious sources?” and “Would they be prepared to attend training that included spiritual/religious content?”. The objective was to ascertain what resources the respondents are already accessing and what would be acceptable to this population.

Most of the respondents (84%) indicated that they had not attended any training on stress management in the previous year. For the firefighters, having attended training correlated positively with the resilience score ($p=0.117$) and negatively with the burnout score ($p=0.071$). This suggests that attending stress management training had a protective effect, both increasing resilience and lowering burnout, and is consistent with findings elsewhere (Mind 2016; Szeto et al. 2019).

More than half of the respondents had talked to someone about their mental or emotional health or stress in the previous year, with one third talking to a friend or family member and one quarter talking to a colleague. These high levels of utilising both peers and family for support are consistent with findings internationally (Donnelly et al. 2016) and in South Africa (Schröder 2012; Wassermann et al. 2019). Nearly half of the respondents (49%) indicated that there was someone they would have liked to talk to about their mental or emotional health in the past year but they were not able to. For the firefighters this unmet need to talk correlated with high burnout scores ($p=0.065$) and low resilience scores ($p=0.007$). A correlation between unmet mental health needs and increased incidence of psychological problems was also found in FRs following hurricane Katrina (McCanlies, Mnatsakanova, Andrew et al. 2014). Identifying this population of FRs who would like to consult someone about their emotional or psychological well-being but have not been able to, could assist with targeting a high-risk sub-group who would benefit from intervention.

A total of 14% of the respondents had consulted a chaplain and 8% a pastor or other religious leader about mental or emotional health concerns, with another 13% and 6% who

would have liked to have consulted a chaplain or religious leader respectively. A proportion of FRs therefore, are already seeking help or would like to seek help from spiritual or religious sources. Nearly 20% of the respondents disagreed or strongly disagreed with attending a training course that included spiritual aspects, with 61% agreeing or strongly agreeing, and the remainder being neutral, while 63% agreed or strongly agreed with the statement “it is important to address spiritual issues in this type of work”. The majority of respondents believe that spiritual issues are important and would be happy to attend a training course that included spiritual issues. These findings are consistent with the findings of previous studies in South Africa that spirituality is generally important for FRs (Van Wyk 2016; Van Straten 2019). FRs might thus be able to utilise their existing spiritual beliefs to increase resilience and decrease burnout.

This chapter presents and analyses the results of the study, and details the answers that were obtained to the three main research questions. The final chapter summarises the conclusions from this study and lists the recommendations that follow from these results.

Chapter 5

Conclusions and Recommendations

5.1 Introduction

The conclusions that may be drawn from this study are outlined in this chapter, followed by recommendations based on these conclusions.

5.2 Conclusions

This study centred around the problem of high rates of psychological symptoms amongst first responders due to their exposure to both chronic workplace stressors and traumatic incidents. The first objective of the research was to determine the levels of work-related burnout in FRs employed by the City of Johannesburg. The study population that comprised firefighters or EMS and DMs shows high levels of work-related burnout. This finding is consistent with the findings of other studies in South Africa, with the levels being slightly higher than those found internationally. These high levels of burnout are likely to be due to high incidences of both CI exposure and chronic workplace stressors. High levels of burnout are a cause for concern as it puts the FRs at increased risk for psychological problems such as depression and PTSD, as well as issues affecting their physical health such as musculoskeletal and cardiovascular disorders. Increased levels of absenteeism, relational difficulties and maladaptive coping mechanisms such as alcohol misuse may also be anticipated because of these high burnout levels.

The second objective of the study was to determine the association between psychological resilience, work-related burnout and R/S in this population. For the firefighters, high intrinsic religiosity or spirituality significantly predicted both higher resilience and lower burnout levels. This finding is consistent with findings both internationally and in South Africa. For the DMs, the score of ORA significantly predicted both a higher BRS and higher CBI score, and the intrinsic religiosity significantly predicted lower burnout and resilience scores. These seemingly contradictory results are difficult to explain and it should be noted that the small number of DMs in the study make it difficult to draw firm conclusions for this group.

The third objective was to determine the resources currently being utilised by the FRs and what resources might be acceptable to them. Nearly one fifth of the firefighters attended a course on stress management in the previous year and this attendance significantly correlated with both higher resilience and lower burnout scores. This finding is consistent with research demonstrating the positive effects of training courses. Over half of the respondents talked to someone about their mental or emotional health or stress in the past

year, with one third talking to a friend or family member and one quarter consulting a colleague. This preference for peer and family consultation is consistent with findings elsewhere. Just under half of the respondents indicated that there was someone they would have liked to talk to, but were not able to, and for the firefighters, this unmet need significantly correlated with high burnout and low resilience scores.

The majority of respondents believed that spiritual issues were important in their work and were happy to attend a training course that included spiritual content. Overall, 14% of the respondents consulted a chaplain and 8% a pastor or other religious leader about mental or emotional health concerns, with another 13% and 6% who would have liked to consult a chaplain or religious leader respectively.

While the study population had high burnout scores, it also had high IR or spirituality scores. With the firefighters at least, this predicted lower burnout and higher resilience as did having attended stress management training. A felt need to consult with someone, which was not realised, strongly predicted high burnout and low resilience scores. These findings suggest interventions that may be effective in reducing the levels of burnout for this population, and these recommendations will now be outlined.

5.3 Recommendations

The nature of the work of FRs means that they are going to be exposed to critical or traumatic incidents, with the concomitant risks of negative psychological sequelae. While it will always be necessary that FRs who develop psychological disorders are treated promptly, it is imperative that the emphasis is shifted towards primary and secondary prevention measures to increase emotional and psychological well-being and prevent the development of psychological disorders such as PTSD. In addition to the obvious human and social benefits of such an approach, it is likely to be cost-effective in terms of decreasing sick leave, increasing the working lifespan of the FRs and decreasing the need for costly psychological treatment. With this in mind, based on the results of this study and consistent with previous research findings outlined in this thesis, the following recommendations are made:

5.3.1 Culture of mental health awareness

Shifting the culture of an organisation towards mental health awareness and acceptance requires ongoing commitment at all managerial levels and appropriate resource allocation. A strategy for mental health should become a part of every departmental development plan

at every level. Departmental meetings could include a section on mental health as a matter of routine, with opportunities for questions, suggestions and feedback.

Information on the nature and symptoms of stress and burnout should be readily available in accessible formats. This could include a series of display posters in fire stations and disaster management offices and regular emails or SMSs with bite-sized information sent to employees.

5.3.2 Training

All FRs should attend training courses on stress management and psychological resilience with regular refresher courses that could be online. The topics in such a course could include:

- Impact of trauma.
- Physiology of the stress response.
- Signs and symptoms to be aware of in yourself and colleagues.
- Nutritional awareness.
- Importance of sleep and exercise.
- Emotional and relational impacts.
- Tools to help yourself.
- The role of spirituality in building resilience
- How to access help when you need it.

5.3.3 Sources of support

The presence of professionals who are available for consultation such as chaplains, EAPs and counsellors should be emphasised regularly. There should be an easy way of requesting help that has no stigma or negative consequences attached to it. Supervisors and managers need to be trained in how to recognise the signs of stress in their employees and intervene effectively.

5.3.4 Peer support

As FRs preferentially talk to their colleagues, it is recommended that training specifically address the issues of recognising the signs of stress in colleagues and how to intervene effectively to help them. Training could also include ways to increase resilience and the role of R/S.

5.3.5 Family and social support

Educational material and training events around the nature of traumatic stress and the impacts it might be having on their friend or family member could be made available, as well as resources on building resilience and the role of R/S.

5.3.6 Faith-based community organisations

Where appropriate, faith-based community organisations that already run counselling services may be identified as an additional resource for FRs.

5.3.7 Decreasing chronic stressors

While exposure to traumatic stress is unavoidable, every effort should be made to limit the chronic organisational stress to which FRs are exposed which compounds the issues. Attention should be given to the work environment, the availability of nutritious food and opportunities for exercise.

5.4 Limitations of the study and suggestions for further research

This study had several limitations that will be discussed, followed by suggestions for further research in this field.

5.4.1 Limitations of the study

5.4.1.1 COVID-19 pandemic

As this study was conducted during the COVID-19 pandemic which is known to have had a deleterious effect on mental health (Gloster, Lamnisos, Lubenko et al. 2020), it is possible that the levels of burnout in the respondents might have been higher, and the resilience levels lower than would otherwise have been the case.

5.4.1.2 Small sample size for disaster managers

The number of DMs in the study was small, making it difficult to be certain of the significance of the findings in this group.

5.4.1.3 Use of the Brief Resilience Scale to measure resilience

Cronbach's alpha for the BRS was low in this study and therefore relying on this measure of resilience in this population may have affected the results.

5.4.1.4 Geographical location

The firefighters were all employed in one region of the City of Johannesburg Metropolitan Municipality and the results may not be generalisable to firefighters working elsewhere in Johannesburg or other locations in South Africa.

5.4.2 Suggestions for further research

5.4.2.1 Disaster managers

Little research is published on DMs as a specific group and it is not clear whether they have the same risks of burnout and other psychological sequelae as more traditional groups of FRs. Further studies are required to assess the risks and coping mechanisms of this group.

5.4.2.2 Validity of the Brief Resilience Scale

A study to determine the reliability of the BRS in the South African population and to determine the most effective resilience scale for use in this population would help to inform further studies in this area.

5.4.2.3 Location

Repeating the study in different locations within South Africa would determine whether these findings are generalisable to first responders across the country.

5.4.2.4 Interventional studies

Measuring burnout and resilience before and after some of the interventions recommended by this study, such as a training course would enable the determination of the most effective intervention measures for FRs.

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Appendix 1: Questionnaire

Date:

Location:

Respondent number:

Please tick ONE box for each of the following questions

1) Gender:

- 1. Male ☐
- 2. Female ☐

2) Your Age Group:

- 1. 18-24 ☐
- 2. 25-34 ☐
- 3. 35-44 ☐
- 4. 45-54 ☐
- 5. 55 and over ☐

3) Race: I would describe myself as:

- 1. Black ☐
- 2. White ☐
- 3. Coloured ☐
- 4. Asian ☐
- 5. Other ☐

4) I would describe my religion as:

- 1. Christian ☐
- 2. Muslim ☐
- 3. Ancestral/tribal/animist/other traditional African religion ☐
- 4. Hindu ☐
- 5. Jewish ☐
- 6. Other religion ☐
- 7. Nothing in particular ☐
- 8. Do not know ☐

5) I have been doing this kind of work (as a first responder) for _____ years and _____ months

6) I am working in:

- 1. Fire Services ☐
- 2. Police ☐
- 3. Emergency medical services ☐
- 4. Disaster Management Centre ☐
- 5. Social Work ☐
- 6. Other ☐

7) Is your work emotionally exhausting?

- To a very high degree ☐
- To a high degree ☐
- Somewhat ☐
- To a low degree ☐
- To a very low degree ☐

For each of the statements on the left please tick one box saying how much you agree or disagree with that statement:

Mark one box per row	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
8) I tend to bounce back quickly after hard times					
9) I would be happy to attend a training course to help me deal with stress that included looking at spiritual issues					
10) I have a hard time making it through stressful events					
11) It does not take me long to recover from a stressful event					
12) It is important to address spiritual issues in this type of work					
13) It is hard for me to snap back when something bad happens					
14) I usually come through difficult times with little trouble					
15) I tend to take a long time to get over set-backs in my life					

16) Do you feel burnt out because of your work?

- | | |
|-----------------------|--------------------------|
| To a very high degree | <input type="checkbox"/> |
| To a high degree | <input type="checkbox"/> |
| Somewhat | <input type="checkbox"/> |
| To a low degree | <input type="checkbox"/> |
| To a very low degree | <input type="checkbox"/> |

17) How often do you attend church or other religious meetings?

- | | |
|-----------------------|--------------------------|
| Never | <input type="checkbox"/> |
| Once a year or less | <input type="checkbox"/> |
| A few times a year | <input type="checkbox"/> |
| A few times a month | <input type="checkbox"/> |
| Once a week | <input type="checkbox"/> |
| More than once a week | <input type="checkbox"/> |

18) Does your work frustrate you?

- | | |
|-----------------------|--------------------------|
| To a very high degree | <input type="checkbox"/> |
| To a high degree | <input type="checkbox"/> |
| Somewhat | <input type="checkbox"/> |
| To a low degree | <input type="checkbox"/> |
| To a very low degree | <input type="checkbox"/> |

19) How often do you spend time in private religious activities, such as prayer, meditation or Bible study?

- | | |
|------------------------|--------------------------|
| Rarely or never | <input type="checkbox"/> |
| A few times a month | <input type="checkbox"/> |
| Once a week | <input type="checkbox"/> |
| Two or more times/week | <input type="checkbox"/> |
| Daily | <input type="checkbox"/> |
| More than once a day | <input type="checkbox"/> |

20) Do you feel worn out at the end of the working day?

- | | |
|--------------------|--------------------------|
| Always | <input type="checkbox"/> |
| Often | <input type="checkbox"/> |
| Sometimes | <input type="checkbox"/> |
| Seldom | <input type="checkbox"/> |
| Never/almost never | <input type="checkbox"/> |

The next section contains statements about religious belief or experience.
Please mark the extent to which each statement is true or not true for you.

	Definitely not true	Tends not to be true	Unsure	Tends to be true	Definitely true of me
21) In my life I experience the presence of the Divine (i.e. God)					
22) My religious beliefs are what really lie behind my whole approach to life					
23) I try hard to carry my religion over into all other dealings in life					

24) Are you exhausted in the morning at the thought of another day at work?

- Always ☐
- Often ☐
- Sometimes ☐
- Seldom ☐
- Never/almost never ☐

25) In the past year I have attended training on stress management:

1. Yes ☐
2. No ☐

26) Do you feel that every working hour is tiring for you?

- Always ☐
- Often ☐
- Sometimes ☐
- Seldom ☐
- Never/almost never ☐

Through my work I have access to a:

- 27) Counsellor Yes ☐ No ☐
- 28) Chaplain Yes ☐ No ☐
- 29) Employee Assistance Practitioner Yes ☐ No ☐

30) Do you have enough energy for family and friends during leisure time?

- | | |
|--------------------|--------------------------|
| Always | <input type="checkbox"/> |
| Often | <input type="checkbox"/> |
| Sometimes | <input type="checkbox"/> |
| Seldom | <input type="checkbox"/> |
| Never/almost never | <input type="checkbox"/> |

31) In the past year, have you talked to anyone about your mental or emotional health or stress levels due to your work?

- No ☐
Yes ☐

32) I have talked to a (tick all that apply):

- | | |
|-------------------------------------|--------------------------|
| 1. Counsellor | <input type="checkbox"/> |
| 2. Employee Assistance Practitioner | <input type="checkbox"/> |
| 3. Psychologist | <input type="checkbox"/> |
| 4. Chaplain | <input type="checkbox"/> |
| 5. Pastor/religious leader | <input type="checkbox"/> |
| 6. Doctor | <input type="checkbox"/> |
| 7. Other professional | <input type="checkbox"/> |
| 8. Colleague | <input type="checkbox"/> |
| 9. Supervisor | <input type="checkbox"/> |
| 10. Friend/family member | <input type="checkbox"/> |
| 11. None of the above | <input type="checkbox"/> |

33) In the past year, for a matter relating to my mental/emotional health/stress levels, I **would have liked to have consulted** (but was not able to) a: (Tick all that apply)

- | | |
|-------------------------------------|--------------------------|
| 1. Counsellor | <input type="checkbox"/> |
| 2. Employee Assistance Practitioner | <input type="checkbox"/> |
| 3. Psychologist | <input type="checkbox"/> |
| 4. Chaplain | <input type="checkbox"/> |
| 5. Pastor/religious leader | <input type="checkbox"/> |
| 6. Doctor | <input type="checkbox"/> |
| 7. Other professional | <input type="checkbox"/> |
| 8. Colleague | <input type="checkbox"/> |
| 9. Supervisor | <input type="checkbox"/> |
| 10. Friend/family member | <input type="checkbox"/> |
| 11. None of the above | <input type="checkbox"/> |

Thank-you for taking the time to answer these questions. The results will be kept confidential.

Appendix 2: Information Leaflet

What is Burnout?

Anyone working with disaster or trauma victims may be vulnerable to burnout which is a state of mental, emotional and physical exhaustion due to high levels of stress over a long period of time.

Symptoms include:

- Feeling helpless, defeated, detached or that you are a failure
- Loss of motivation/ not being able to take responsibility
- Feeling tired all the time
- Frequent headaches
- Using alcohol or drugs to cope
- Missing work frequently or coming in late and leaving early

For more information see: <https://www.helpguide.org/articles/stress/burnout-prevention-and-recovery.htm>

If you are experiencing any of these symptoms, please consult your General Practitioner or mental health practitioner. Additional help can be obtained from:

- The South African Depression and Anxiety Group (SADAG)
<http://www.sadag.org/>
- Emthonjeni Community Psychology Clinic
Ms Paballo Lepota Tel: +27 (0)11 717 4513
Email: paballo.lepota@wits.ac.za
<https://www.wits.ac.za/shcd/emthonjeni-centre/clinical-services/emthonjeni-community-psychology-clinic/>
- FAMSA Tel: (011) 975 7106/7
Email: national@famsa.org.za
<http://famsa.org.za/>
- Emergency Services chaplaincy
info@escsa.org.za
+27 82 329 9973
<http://www.escsa.org.za/index.php>

Appendix 3: Participant Consent Form

RESEARCH STUDY INFORMATION LEAFLET AND CONSENT FORM

DATE *June-November 2020*

TITLE OF THE RESEARCH PROJECT

Spirituality and its Contribution to Increasing Psychological Resilience and Decreasing Burnout amongst First Responders in the City of Johannesburg

PRINCIPLE INVESTIGATOR / RESEARCHER(S) NAME(S) AND CONTACT NUMBER(S):

Dr Rebecca Williams

2018266573

083 558 9065

FACULTY AND DEPARTMENT:

Natural and Agricultural Sciences

Disaster Management Training and Education Centre (DiMTEC)

STUDYLEADER(S) NAME AND CONTACT NUMBER:

Dr E du Plessis

082 850 6045

WHAT IS THE AIM / PURPOSE OF THE STUDY?

The study is looking at stress and burnout in first responders in the City of Johannesburg. The study focuses on psychological resilience (the ability to cope) and whether people use their religion or spirituality to help them cope.

WHO IS DOING THE RESEARCH?

Dr Rebecca Williams is a General Medical Practitioner and this research forms part of her Masters in Disaster management.

HAS THE STUDY RECEIVED ETHICAL APPROVAL?

This study has received approval from the Research Ethics Committee of UFS. A copy of the approval letter can be obtained from the researcher.

Approval number: UFS-HSD2020/0659/2205

WHY ARE YOU INVITED TO TAKE PART IN THIS RESEARCH PROJECT?

You have been invited to participate in this research project as you are a first responder (fire fighter, paramedic, police officer, social worker or disaster management officer) employed by the City of Johannesburg, in Sandton/Alexandra Region E. Approximately 150 people will participate in this study.

WHAT IS THE NATURE OF PARTICIPATION IN THIS STUDY?

The study involves filling in a questionnaire by ticking boxes. The questions are to do with work-related stress and sources of help that might be available to you. The questionnaire should take you 10-15 minutes to complete.

CAN THE PARTICIPANT WITHDRAW FROM THE STUDY?

Taking part in this study is voluntary and you are under no obligation to consent to participate. If you do decide to take part, you will be given this information sheet to keep and be asked to sign a written consent form. You are free to withdraw at any time while you are filling in the questionnaire and without giving a reason. The questionnaires are anonymous, so it will not be possible to withdraw once you have submitted the questionnaire as it will not be possible to tell which questionnaire is yours.

WHAT ARE THE POTENTIAL BENEFITS OF TAKING PART IN THIS STUDY?

There is no payment for participating in this study. However, if studies like this demonstrate that there are high levels of work-related burnout amongst first Responders it might be possible to motivate for more training and support to be available. Your participation in the study will be kept confidential.

WHAT IS THE ANTICIPATED INCONVENIENCE OF TAKING PART IN THIS STUDY?

Answering this questionnaire will take 10-15 minutes of your time, either during your break, or during a quiet part of your shift. It is possible that thinking about work-related stress may make you feel anxious or uncomfortable. You will be given a leaflet detailing resources that are available for you to access help and counselling if you would like.

WILL WHAT I SAY BE KEPT CONFIDENTIAL?

The information that you give will be confidential, your name will not be recorded anywhere, and no one will be able to connect you to the answers you give. Your answers will be given a fictitious code number, and you will be referred to in this way in the data, any publications, or other research reporting methods such as conference proceedings. Your answers may be reviewed by people responsible for making sure that research is done properly, including the transcriber, external coder, and members of the Research Ethics Committee, but your answers will only be identified by the code number, not by your name. The only record that identifies you in any way is the signed consent form and that will be kept separately from your answers and will be available only to people working on the study. The anonymous data may be used for other purposes, e.g. research report, journal articles, conference presentation, etc., but it will not be possible to identify you or your answers. A report of the study may be submitted for publication, but individual participants will not be identifiable in such a report. You may refuse to take part in this study, and you can stop being in the study at any time while answering the questions.

HOW WILL THE INFORMATION BE STORED AND ULTIMATELY DESTROYED?

Hard copies of your answers will be stored by the researcher for a period of five years in a locked filing cabinet in the researcher's home office, for future research or academic purposes; electronic information will be stored on a password protected computer. Future use of the stored data will be subject to further Research Ethics Review and approval if applicable. After 5 years the information will be destroyed by shredding the questionnaires and electronic data will be deleted.

WILL I RECEIVE PAYMENT OR ANY INCENTIVES FOR PARTICIPATING IN THIS STUDY?

There is no payment or reward for participating in this study.

HOW WILL THE PARTICIPANT BE INFORMED OF THE FINDINGS / RESULTS OF THE STUDY?

If you would like to be informed of the final research findings, please contact Dr Rebecca Williams on 083 558 9065 or email: williamsrebecca66@gmail.com. The findings are accessible for 1 year. Should you require any further information or want to contact the researcher about any aspect of this study, please contact Dr Rebecca Williams 083 558 9065 williamsrebecca66@gmail.com. Should you have concerns about the way in which the research has been conducted, you may contact Dr E du Plessis (supervisor) 082 850 6045 duplesed@ufs.ac.za.

Thank you for taking time to read this information sheet and for participating in this study.

CONSENT TO PARTICIPATE IN THIS STUDY

I, _____ (participant name), confirm that the person asking my consent to take part in this research has told me about the nature, procedure, potential benefits and anticipated inconvenience of participation.

I have read (or had explained to me) and understood the study as explained in the information sheet. I have had sufficient opportunity to ask questions and am prepared to participate in the study. I understand that my participation is voluntary and that I am free to withdraw at any time without penalty (if applicable). I am aware that the findings of this study will be anonymously processed into a research report, journal publications and/or conference proceedings.

I agree to the recording of the questionnaire.

I have received a signed copy of the informed consent agreement.

Full Name of Participant:

Signature of Participant: _____


Date: _____


Full Name(s) of Researcher(s):

Signature of Researcher: _____

Date: _____

Appendix 4: Permission Letters

 **Joburg**
a world class African city



City of Johannesburg
Emergency Management Services

Public Safety Headquarters PO Box 1496 Tel +27(0) 11 758 9100
195 Main Road Johannesburg Fax +27(0) 11 758 9189
Mortindale South Africa
2000 2000

To: Rebecca Williams
Principal Investigator
University of Free State

From: Acting Executive Head: R. Monageng
Acting Executive Head
EMS

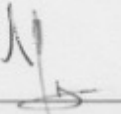
19 October 2020

RE: REQUEST TO CONDUCT A RESEARCH STUDY: SPIRITUALITY AND ITS CONTRIBUTION TO INCREASING PSYCHOLOGICAL RESILIENCE AND DECREASING BURNOUT AMONGST FIRST RESPONDERS IN THE CITY OF JOHANNESBURG

Dear Rebecca Williams

After considering, all documents submitted to City of Johannesburg: Emergency Management Services, I hereby confirm that, **REBECCA WILLIAMS MAY / MAY NOT** conduct his research study in the City Of Johannesburg: Emergency Management Services.

Yours Sincerely

 27/10/2020

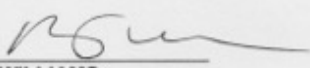
**R. MONAGENG
ACTING EXECUTIVE HEAD
EMS**

ONCE PERMISSION IS GRANTED-

THE FOLLOWING CONDITIONS SHOULD BE ADHERED TO:

- Findings / results to be made available to CoJEMS Executive Management.
- Recommendations to be suggested based on the outcome of the study.
- Implications to be suggested.

I acknowledge and will abide to the conditions listed above.



**REBECCA WILLIAMS
PRINCIPAL INVESTIGATOR
UNIVERSITY OF FREE STATE**



City of Johannesburg
Public Safety Department

Disaster Management Centre
140 Linden Road
Sandton
2092

PO Box 1496
Johannesburg
South Africa
2000

Tel: +27(0) 11 222 8293
E-mail: cojdmcc@joburg.org.za
www.joburg.org.za

11 August 2020

To: Dr. Rebecca Williams
Principle Investigator
University of Free State

CC: Mr. Tshepo Motlhale
Acting Director
Disaster Management Centre

**RE: APPROVAL TO CONDUCT A RESEARCH IN THE CITY OF JOHANNESBURG
DISASTER MANAGEMENT CENTRE**

Dear Dr. Rebecca Williams

In relation to your letter dated 04 May 2020, the City of Johannesburg Disaster Management Centre hereby grants approval for Research to be conducted as per title - *Spirituality and its contribution to increasing psychological resilience and decreasing burnout amongst responders in the City of Johannesburg Disaster Management Centre.*

When conducting research or interviewing participants, you are required to take into consideration Covid-19 safety measures at all-times.

Kindly indicate the date(s) you wish to commence a week before so that we can inform the Disaster Management team on time.

Yours Sincerely.

Mr. Aaron Ralatsane
Acting Divisional Head
City of Johannesburg Disaster Management Centre

Appendix 5: Ethical Approval



GENERAL/HUMAN RESEARCH ETHICS COMMITTEE (GHREC)

14-Aug-2020

Dear Dr Rebecca Williams

Application Approved

Research Project Title:

Spirituality and its contribution to Increasing Psychological Resilience and Decreasing Burnout amongst First Responders in the City of Johannesburg

Ethical Clearance number:

UFS-HSD2020/0659/2205

We are pleased to inform you that your application for ethical clearance has been approved. Your ethical clearance is valid for twelve (12) months from the date of issue. We request that any changes that may take place during the course of your study/research project be submitted to the ethics office to ensure ethical transparency. Furthermore, you are requested to submit the final report of your study/research project to the ethics office. Should you require more time to complete this research, please apply for an extension. Thank you for submitting your proposal for ethical clearance; we wish you the best of luck and success with your research.

Yours sincerely

Dr Adri Du Plessis

Chairperson: General/Human Research Ethics Committee

**Adri du
Plessis**
2020.08.14
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Appendix 6: Confirmation of Editing and Proofreading

Nicolene Barnard Proofreading and Technical Editing

PO Box 26959, Langenhovenpark, 9330 | 073 339 7739 |

Nicolene.Barnard1@gmail.com

26 April 2021

CONFIRMATION OF EDITING AND PROOFREADING

I hereby confirm that I have done the technical layout and language editing for the following dissertation:

Student: Rebecca Jane Williams
Title: Spirituality and its contribution to increasing psychological resilience and decreasing burnout amongst first responders in the City of Johannesburg
Degree: Masters in Disaster Management
Department: Disaster Management Training and Education Center for Africa, University of the Free State

My work for the student included the technical layout of the document, as well as language editing for grammar, punctuation, spelling, and sentence structure. I tried to keep as much as possible of the student's own writing style while making sure that the student's intended meaning was not altered in the editing process. I also checked the list of references making sure that dates, spelling, and names used in the text are consistent with those listed in the reference list.

I have a B.Bibl. (Hons.) Degree and have been working as a cataloguer and librarian for 29 years. I am an expert in the field of bibliographic information and resources. I have also completed a 10-week Copy-Editing course at the University of Cape Town.

Disclaimer: The ultimate responsibility for accepting or rejecting the changes and recommendations rests with the student and I cannot be held responsible for any layout or language issues that might have emerged as a result of subsequent amendments to the text.

Yours sincerely,



Nicolene Barnard