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Risk and Protective Factors Associated with Psychosocial Functioning in 911 Operators and Dispatchers

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RISK AND PROTECTIVE FACTORS ASSOCIATED WITH PSYCHOSOCIAL

FUNCTIONING IN 911 OPERATORS AND DISPATCHERS

By Margarett Molina

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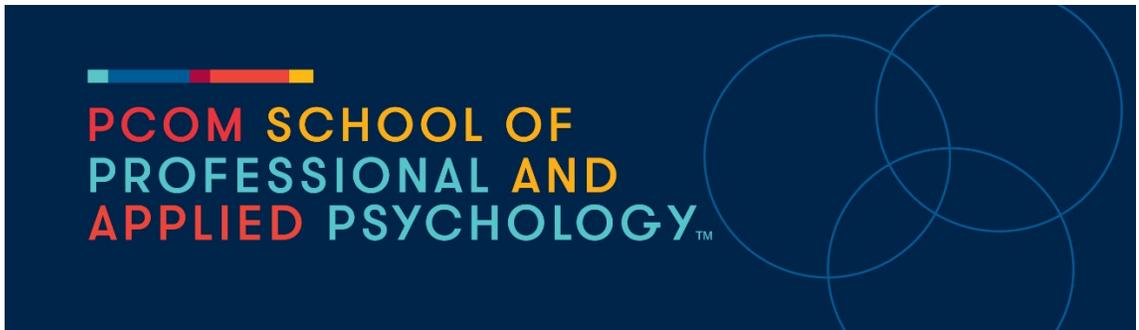
DISSERTATION APPROVAL

This is to certify that the thesis presented to us by Margarett Molina on the 14th day of July,

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has been examined and is acceptable in both scholarship and literary quality.

COMMITTEE MEMBERS' SIGNATURES

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_____, Chair, Department of Clinical Psychology

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DEDICATION

To 911 operators and dispatchers: I see you, and hope this work allows others to see you and learn to understand and appreciate all that you do for us. Thank you for your services.

ACKNOWLEDGEMENTS

I would like to express my deepest gratitude to my chair, Dr. Lent. Your positive praises, support, and guidance throughout this entire process was unyielding. Thank you for creating such an incredibly safe and kind space for our work to grow. Thank you to my committee members, Drs. White and Czerny. Your excitement and feedback on this project were uplifting and motivating.

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Finally, thank you to my partner, for your unconditional and positively overwhelming love and support. The trust and understanding it takes to make the amount of sacrifices necessary to accomplish this goal is unreal. Having you by my side during all of this has been a remarkable part of our long-life journey ahead.

TABLE OF CONTENTS

LIST OF TABLES AND FIGURES

ABSTRACT

911 operators and dispatchers are considered the true "first responders" to life-threatening emergencies. Their responsibilities include responding to individuals in crisis, deciding appropriate emergency responses, gathering vital information, offering emergency instruction, and providing detailed updates about the response to callers and emergency workers. This high rate of exposure to traumatizing events enhances the risk for pathology, including posttraumatic stress symptoms (PTSS) and depressive symptoms. The objective of this study was to examine the relationship between social supports, coping style, and sleep as it relates to PTSS and depressive symptoms in 911 operators and dispatchers. Multiple linear regression models were computed to assess the effects of social support, coping style, and sleep on PTSS and depressive symptoms on operators. Participants completed online questionnaires; sample size varied as not every participant completed every measure. The Social Provisions Scale (SPS) assessed social support received ($N = 140$); the Coping Strategies Inventory Short-Form (CSI-SF) assessed type of coping style ($N = 142$); and the Pittsburg Quality of Sleep Index (PSQI) assessed quality of sleep ($N = 127$). Participants completed the Post Traumatic Stress Disorder Checklist for the *DSM-5* (PCL-5; $N = 133$) and the Patient Health Questionnaire-8 (PHQ-9; $N = 131$) to assess PTSS and depressive symptoms. Results found social support predicted lower PTSS and depressive symptoms; greater emotion-focused disengagement strategies predicted lower PTSS depressive symptoms; and poor sleep quality predicted higher PTSS and depressive symptoms. Clinical implications and future directions are discussed.

Keywords: posttraumatic stress symptoms, depression, 911 operators, dispatchers

CHAPTER 1: INTRODUCTION

Statement of the Problem

As of 2018, the U.S. Bureau of Labor Statistics (BLS; 2019) reported that 95,020 police, fire, and ambulance dispatchers were employed nationwide. Professional duties of dispatchers, also known as 911 operators, include triaging emergency calls, gathering important information, and determining the appropriate aid necessary for each call (Mann, 2016). Operators are technically considered "clerical" workers; however, operators are frequently the first nonphysical contact with individuals in emergency situations. In an average 12-hour shift, operators are responsible for 40 to 120 calls that vary in intensity. During these long shifts, operators are exposed repeatedly to emergency calls regarding battery and assaults, unexpected death or injury of children, suicide attempts, sexual assaults, and accidents, among other traumatic events (Pierce & Lilly, 2012). This high, consistent rate of chronic exposure to potentially traumatizing events may increase the risk for psychopathology, including posttraumatic stress disorder (PTSD) and depression, in operators (Lilly & Allen, 2015). Moreover, many operators work overtime, surpassing typical 12-hour shifts, during holidays, as well as overnight, which has been found to interfere with physical, mental, and social well-being (Vogel et al., 2012).

There are several differences between "on scene" first responders and dispatchers. On scene first responders have in vivo exposure to the traumatic events and may be in direct danger, whereas operators have been classified as having clerical positions since they remain in offices and do not visually witness traumatic events. Nevertheless, Mann (2016) posited that dispatchers are the only clerical positions in the department that endure a high level of stress while remaining calm and completing necessary responsibilities to keep callers and emergency personnel safe. Given the repeated, consistent exposure to traumatic event details over time,

studies have evaluated PTSD symptoms in dispatchers (Dicks, 2014; Pierce & Lilly, 2012; Troxell, 2008).

On scene first responders' and operators' experiences differ in regard to how they witness these traumatizing events; however, it may be argued that due to either form of exposure, on scene first responders and dispatchers may demonstrate similar impairments in their psychosocial functioning. On scene first responders visually witness the aftermath of varying levels of traumatic events. Having visual memories of trauma could impact on scene first responders' rates of distress. These trauma memories can contribute to the presence of posttraumatic stress symptoms (PTSS) and depression. Operators hear directly from callers during various response phases of emergencies. Operators audibly witness traumatic events wherein they are exposed to individuals during terribly traumatic events such as sexual assaults and deaths.

Although operators are not physically present during traumatic events or have personal relationships with victims, exposure to duty-related aversive event details can be sufficient to induce PTSD symptomatology severe enough to be consistent with a probable diagnosis (Pierce & Lilly, 2012). Additionally, this exposure to trauma can be comparable to trauma experienced by many emergency responders who are physically at a scene (e.g., screams, panic, crying). Moreover, an operator may never obtain closure on the fate of the victim once a call is completed, which may impact PTSS. Not surprisingly, 24.6% to 30.8% of sampled 911 operators have reported having PTSS (Dicks, 2014; Pierce & Lilly, 2012). PTSS indicates intense fear or helplessness experienced by an individual after a traumatic event (Klimley et al., 2018).

A review of the literature found that 7% to 22% of first responders in general reported experiencing depression (Jones et al., 2018). In contrast, other findings indicated 85% of first responders (i.e., emergency medical technicians physically present on scene) reported symptoms related to mental health issues, 84% endorsed that they experienced a traumatic event on the job, and 34% had a formal mental health diagnoses compared to 6% of the general population (University of Phoenix, 2017). Specifically, 27% of overall first responders reported a diagnosis of depression and 47% attributed incidents at work to the development of their depression (University of Phoenix, 2017).

Psychopathology, including PTSS and related depression among dispatchers and other first responders, has significant implications for public health. PTSS and depressive disorders can result in reduced concentration and decision-making capacity (Allen et al., 2016). Impairment in these domains may place the general population at risk given the reliance on dispatchers to quickly and efficiently coordinate an emergency response.

The fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (*DSM-5*) is the most widely accepted classification used by clinicians for the classification of mental disorders (American Psychiatric Association [APA], 2013). PTSD is a trauma-related disorder characterized by exposure to actual or threatened death, serious injury, or sexual violence. This exposure may by either directly experiencing or witnessing the event, learning that the traumatic event has occurred, or experiencing repeated or extreme exposure to aversive details of traumatic events (e.g., first responders and dispatchers; APA, 2013). Additional symptoms that may present in PTSD include distress or impairment in functioning, intrusive reexperiencing of the event(s), changes in mood and thinking, heightened arousal, emotional detachment, and avoidance of trauma-related stimuli for at least 1 month.

Therefore, according to the criteria, operators' experiences may place them at risk for

PTSD because they are exposed chronically to duty-related aversive details of traumatic events

(Pierce & Lilly, 2012). The projected lifetime risk for PTSD by age 75 in the general population

is 8.7%, and the annual prevalence rate is approximately 3.5%. Rates of PTSD are higher among

those whose vocation increases the risk of traumatic exposure (APA, 2013), such as first

responders, including operators. The average prevalence rate of PTSD in the United States is

3.4% (APA, 2013); however, studies on 911 operators report prevalence rates of PTSD

symptoms to be significantly higher at 24.6% to 30.8% (Dicks, 2014; Pierce & Lilly, 2012).

Whereas PTSS are the immediate negative reactions that occur right after a traumatic

experience and PTSD is a clinical diagnosis that is only met after 6 months of experiencing

similar negative reactions that cause significant distress in areas of important functioning (APA,

2013), *peritraumatic distress* refers to the immediate negative emotions related to traumatic

events (Brunet et al. 2001). Troxell (2008) found the majority of dispatchers in the sample

reported experiencing peritraumatic distress in reaction to at least one call handled while on duty.

Operators reported experiencing fear, helplessness, or horror in reaction to 32% of different

types of calls (Pierce & Lilly, 2012). Moreover, peritraumatic distress was found to have

predictive value toward PTSD development (Birmes et al., 2005). Therefore, peritraumatic

distress is important to consider when discussing the presence of PTSS in this population.

Just as not everyone who experiences a traumatic event will develop PTSD or related

symptoms, not all dispatchers will develop PTSD despite exposure to traumatic events. This

variability may relate to several protective factors that decrease the likelihood of developing

PTSD, such as positive and stable support systems, the availability of resources, and healthy

coping styles (Allen et al., 2016; Guay et al., 2006). Conversely, there are also risk factors that

may increase the likelihood of developing PTSD, such as history of mental health problems or poor psychosocial support (National Center for PTSD, 2018).

  A model explaining the relationships between social support and PTSD theorized poor social support increases PTSD symptoms primarily through cognitive processes that result from not processing traumatic thoughts or expressing emotions (Joseph et al., 1997). Low levels of social support are considered one of the most important precursors in the development (Guay et al., 2006) and maintenance (Schnurr et al., 2004) of PTSD symptoms.

  Therefore, social support is an important factor to consider in psychosocial functioning. Overall, first responders may shield family members and others from the traumatic incidents they are exposed to at work (Dicks, 2014). It is plausible that dispatchers may also engage in this behavior, but this requires further study. Not being able to process what happened at work with closest ones and receiving feedback or emotional support may be perceived as having poor social support.

  Due to the nature of dispatchers' work, emotional stress is an intrinsic part of the job (Weibel et al., 2003). In considering social support within this population, receiving helping behavior related to reassurance was associated with lower levels of depression (Cutrona & Russell, 1987). Non-assistance-related provisions, such as reassurance of worth (e.g., recognition of one's competence, skills, and value by others) had beneficial effects under conditions of high and low stress (Cutrona & Russell, 1987). Those who reported lower levels of perceived social support after traumatic events also reported higher levels of PTSS (Ozer et al., 2008). This nontangible form of support from others may also impact the victim's emotional states (e.g., fear, panic, grief, guilt, and shame) and coping strategies (i.e., degree of avoidance of thoughts and behaviors) directly or via reappraisal mechanisms (Williams & Joseph, 1999).

Given the amount of stress evident in this population, as well as the need to put personal reactions aside in order to perform their duties (Allen et al., 2016), it is imperative to assess coping style. Different forms of coping are important contributing factors in differentiating those who develop PTSS and depression from those who do not develop these conditions despite similar exposure to traumatic events.

Emotion-focused coping behaviors involve conscious attempts to alter or avoid an emotional reaction to a situation, whereas problem-solving behaviors focus on action and solutions related to the situation at hand (Folkman & Lazarus, 1985). Emotion-focused forms of coping in adulthood have recurrently been linked to negative outcomes such as PTSS following trauma (Hassija et al., 2012; Lilly & Graham-Bermann, 2010). Researchers have agreed this connection may be due to emotion-focused coping in promoting and maintaining avoidance associated with a lack of adequate trauma processing as well as the development and maintenance of common PTSS (e.g., hypervigilance and nightmares; Ehlers & Clark, 2000; Littleton et al., 2007).

Allen and colleagues (2016) sampled 911 operators and found emotion-focused behaviors such as avoidance were positively associated with PTSS. Self-controlling and escape-avoidance behaviors were positively related to PTSS. Conversely, positive reappraisals were inversely related to PTSS within this sample (Allen et al., 2016). Some emotion-focused coping strategies might be effective as dispatchers complete their work duties to cope with daily calls from people experiencing trauma and crisis; yet it may be a risk factor for psychopathology in the long-term (Adams et al., 2015; Allen et al., 2016).

A common response to stressful life events is engagement in effortful attempts to avoid or reduce negative affect as a way to protect oneself from the immediate reality of the trauma.

Nevertheless, this disengagement can be ineffective or maladaptive, and may hinder recovery because recovery involves dealing with trauma and its effects (Littleton et al., 2007). Avoidant coping strategies are related to more PTSD symptoms (Ullman et al., 2007), whereas, successful strategies such as cognitive restructuring, expressing one's emotions, and seeking social support lead to better recovery and decreased PTSD symptoms over time (Gutner et al., 2006).

Dispatchers work fast and are in constant "fight" mode due to surges of adrenaline (Weibel et al., 2003). They can be in constant adrenaline rush for weeks or months at a time. Living in this state of adrenaline can lead to mental and physical health problems (Dicks, 2014). It can become difficult to "turn off" at the end of a shift, which can cause sleep disturbances and feeling the need to be alert at all times, in addition to expecting and trying to prevent the worst (Weibel et al., 2003). This sleep disturbance can impact an individual in a variety of ways, including his or her work life, which is important to consider (Åkerstedt, 2003; Härmä et al., 1998).

Sleep is important for the physical, social, and mental well-being of individuals (Matricciani et al., 2018). Sleep cycles restore and refresh the body and mind. Sleep issues have been associated with psychosocial functioning such as impairments in cognitive function, chronic illness, and reduced mental health including depressive and anxiety symptoms (Strine & Chapman, 2005). Impairments in cognitive functioning are important to consider in operators, as they are required to use skills such as decision-making to provide accurate and efficient emergency responses. Psychosocial functioning impairments due to insufficient quality and quantity of sleep impacts different work and leisure activities (Manocchia et al., 2001). Given operators' schedules, potential overtime work, and other personal obligations, they may not be getting necessary sleep to restore their overall functioning. Furthermore, adverse behavior-

related factors such as smoking and physical inactivity were also associated with sleep issues (Strine & Chapman, 2005). The impact of physical inactivity is important to note given an operator is sedentary for most, if not all of his or her shift's duration. This inactivity for hours at a time, often without the ability to take a break given the nature of the job, has been identified as an obstacle to trauma resolution (Dvoskina & Cole, 2020).

A suggested mediator of effects on stress related to sleep was the inability to free oneself of thoughts of work during leisure time (Åkerstedt et al., 2002). In a sample of dispatchers, Troxell (2008) found one of the most prevalent PTSD symptoms was repeated disturbing memories, thoughts, or images of the stressful experience. These symptoms may impact dispatchers' ability to fall or stay asleep, impacting sleep quality. Other risk factors for disturbed sleep related to dispatchers and their work environment include high work demands, low decision latitude, low social support at work, solitary work, and not being able to stop thinking about work, (Åkerstedt et al., 2002).

Purpose of the Study

Operators' field of work involves repeatedly being exposed to traumatic events. Social supports, coping style, and sleep are important domains of functioning that impact the development of psychopathology. Thus, the present study was developed to examine the relationship between social support, coping style, and sleep on the presence of PTSS and depressive symptoms in 911 operators and dispatchers. This study was also intended to contribute to the literature by documenting the presence of PTSS and depressive symptoms in this population, as well as possible risk and protective factors in operators. Psychopathology among this population has significant implications for public health as it can result in reduced concentration and decision-making capacity (Allen et al., 2016). Concentration and decision-

making skills are essential in providing efficient and accurate emergency responses. Given the

quantity and severity of exposure to potentially traumatic events multiple hours each day, it is

imperative to understand risk and protective factors to promote psychological wellness within the

population of 911 operators and dispatchers.

Hypotheses

Given the research gathered, the possible impact of poor psychosocial functioning within

this population on public health, and the gap in the literature regarding the presence of poor

psychosocial functioning, the following hypotheses were formulated. First, it was hypothesized

that higher levels of nontangible social supports, as measured by Social Provision Scale (Cutrona

& Russell, 1987) would predict lower PTSS and depression symptomology as measured by the

Post Traumatic Stress Disorder Checklist for the *DSM-5* (PCL-5; Weathers et al., 2013) and

Patient Health Questionnaire-9 (PHQ-9; Kroenke et al., 2009). Second, it was hypothesized that

greater use of emotion disengagement as measured by Coping Strategies Inventory Short-Form

(CSI-SF; Addison et al., 2007) would predict higher PTSS and depression as measured by the

PCL-5 and PHQ-9. Third, it was hypothesized that poorer sleep quality as measured by the

Pittsburg Sleep Quality Index (PSQI; Buysse et al., 1989) would predict higher levels of PTSS

and depression as measured by the PCL-5 and PHQ-9.

CHAPTER 2: LITERATURE REVIEW

911 operators and dispatchers are considered the true "first responders" to life-threatening emergencies (Anshel et al., 2013). 911 operators and dispatchers are seen as "central to the coordination and implementation of critical incident response activity" (Steinkopf et al., 2018, p.1). Operators and dispatchers serve similar functions and, therefore, the term operator will be used to reflect both types of employees. Operators' responsibilities include responding to individuals in crisis, deciding the appropriate emergency response, gathering vital information, offering emergency instruction, and providing detailed updates about the response to both civilians and emergency workers (J. B. Davis, 2005; Steinkopf et al., 2018). Although operators typically do not experience or witness events directly, they are exposed constantly to these events via telephone. Operators work lengthy shifts in which they are consistently exposed to both ordinary and emergency calls, such as fires, accidental deaths, homicides, child injuries, and sexual assaults (Pierce & Lilly, 2012).

It has been postulated that dispatchers experience "auditory exclusion," which refers to their heightened auditory senses as they listen acutely to callers in order to receive the most vital information to ensure a successful dispatch call (Soria, n.d.). As operators work fast while being mindful of the need to perform perfectly, they constantly experience a surge of adrenaline and cortisol and are ultimately in "fight" mode while sitting at their desks (Dicks, 2014; Soria, n.d.). As a result of constantly answering an unpredictable volume of calls in succession, it can be argued that operators have a limited ability to rid themselves of this adrenaline and excess cortisol, as these hormones take time to reduce (Soria, n.d.). The difficulty in controlling this emotional and physical state—for weeks or months at a time—leads to the accumulation of these

hormones in the body, which increases stress levels that can impact emotional and cognitive functioning (Dicks, 2014; Soria, n.d.).

Furthermore, the emotional stress associated with these operator tasks leads to hyperactivity of the hypothalamic-pituitary-adrenocortical (HPA) axis (Weibel et al., 2003). Studies have found that the HPA axis is an important link between chronic stress and pathological states (Reul et al., 2000). Psychosocial factors have been proposed to impact an individual's health because of HPA hyperactivity due to psychosocial stressors (DeVries et al., 2003, Hostinar & Gunnar, 2013). Research findings have found connections between hyperactivity of the HPA axis with social isolation, loneliness, and perceived social support (Adam et al., 2006; Stafford et al., 2013; Staufenbiel et al., 2014; Steptoe et al., 2004).

Stress activates the sympathetic nervous system and the HPA axis, which causes a release of stress hormones (de Kloet et al., 2005). Glucocorticoid cortisol is one of the stress hormones associated with this activation and was found to be associated heavily with different cognitive processes (for a review, see Lupien et al., 2007). Additionally, glucocorticoid cortisol has been found to be an important factor in the relationship between health and psychosocial factors (Iob et al., 2018). Overall, higher levels of cortisol have been linked to a variety of mental health problems (Adam et al., 2017), including depression and stress (Römer et al., 2009; Scharlau et al., 2018; Vanaelst et al., 2013).

Jenkins (1997) suggested that the pressures associated with operators induce high levels of stress equal to those of "on the scene" emergency workers. The culture of the emergency communications center is similar to that of their respective police and fire department cultures in three important ways. First, operators are taught to be stoic and in control at all times. Second, operators are exposed to adverse details and trauma. Third, operators experience a variety of

difficulties in coping while at work or home and these difficulties are stigmatizing and isolating (Fay et al., 2006; Forslund et al., 2004; Levensen, n.d.; Robinson-Kitt, 2009; Shuler & Davenport Syher, 2000; Troxell, 2008). A noteworthy difference between operators and "on the scene" first responders is the process of mandatory debriefings. Critical incident stress debriefings have been found to be helpful in mitigating mental health concerns for first responder populations (Burque et al., 2014); however, only "on scene" first responders are required to attend, whereas operators are not mandated to attend despite similarities in the risks for mental health concerns (Burque et al., 2014).

911 operators experience a high rate of chronic exposure to potentially traumatizing events, which enhances the risk for psychopathology, including PTSD and depression (Lilly & Allen, 2015). Despite their physical distance from the crisis scene, operators can experience vicarious trauma through acute and cumulative exposure to traumatic incidents and their perceived lack of control, which can expound feelings of helplessness (Adams et al., 2015). PTSD symptoms that may be present in operators can impair decision-making abilities and functioning, which could pose significant risk to the general population that relies on them to quickly and effectively coordinate an emergency response (Pierce & Lilly, 2012). Further, operators frequently work 12-hour shifts with mandatory overtime due to low retention rates and staff shortages in the United States (Dicks, 2014). Operators typically get 1 to 1.5 hours of break time resulting in about 10.5 hours of call taking, which can result in in between 40 and 120 emergency calls per shift (Dicks, 2014). Given the amount of stress, exposure to traumatic events, length of shifts, and other work-related factors, it is unsurprising that the current national turnover rate for operators is between 17% and 19% (Gallagher, 2014).

According to *USA Today*, 911 centers across the country are finding it difficult to hire enough operators, impacting the time it takes to answer emergency calls (Davidson, 2018). Some attribute this challenge to the nation's 3.9% unemployment rate (Davidson, 2018). The National Emergency Number Association (NENA) promotes 911 awareness and advances in this field. Although there is no national data on 911 operator shortages, NENA's operations director stated, "the gaps have worsened and spread- from larger cities to small and midsize ones as well" (Davidson, 2018, para. 28). NENA has estimated 240 million emergency and nonemergency 911 calls per year (Davidson, 2018). The direct impact of this shortage can be seen in the time it takes to answer emergency calls. Davidson (2018) reported that in 2017, 3% of their 246,290 emergency calls took more than 1 minute to answer instead of the expected 10 seconds or less that it should. This increase in wait time led to injury and even death (Davidson, 2018). Davison stated worker shortages lead to more overtime, increasing stress and fatigue, and opening up the possibility of operator error and attrition within this field. Although operators typically undergo an aptitude test and psychological evaluations, it may be difficult to prepare for such an emotionally stressful job.

Given the job responsibilities required of operators, they must remain alert and use executive functioning throughout their shifts. These important processes are needed in order to provide efficient emergency responses. Moreover, impairment in these processes due to chronic exposure to traumatic events may impair their psychosocial functioning. When these impairments are present, operators may then have difficulties coping with the constant exposure to trauma. Difficulties coping with these trauma-related stressors may lead to PTSS. These trauma symptoms may impact important functioning such as sleep, needed to restore the processing and functioning needed. External factors such as low pay and high turnover rates

impact operators' mandatory overtime. This mandatory overtime leads to more time at work and, therefore, additional exposure to trauma. Receiving emotional support from others may help improve operators' overall ability to cope with trauma, which would help psychosocial functioning. It is imperative to understand the possible risk and protective factors that may discriminate individuals who develop PTSS and depression and those who do not. By doing so, departments may intervene and provide support to employees and ensure their mental health is being considered as a priority so they can provide efficient emergency responses.

Ecological Systems Theory

Ecological systems theory (EST) is defined as the study of the multiple interconnected environmental systems that influence individual development (Bronfenbrenner, 1977). The ecological levels are microsystem, mesosystem, exosystem, and macrosystem. The microsystem entails a pattern of activities, roles, and interpersonal relations experienced in systems that contain face-to-face relationships (Voydanoff, 2001). This level includes family, peer group, and work and how the individual is receiving support from others. Within the context of this theory, social support is a factor of interest for operators, as it contributes to mental health (Kondrat et al., 2018). Likewise, coping style is a factor of interest, as high levels of stress can overload and negatively impact physical and mental systems (Eriksen et al., 1999; Sapolsky, 1996). There are numerous coping styles related to poorer psychosocial functioning. Specifically, the avoidance-type of coping, such as emotion disengagement, has been associated with increased anxiety and depression (Grant et al., 2013).

The mesosystem includes relationships between microsystems, or the connections between situations (Brofenbrenner, 1979). Examples of these relationships between microsystems are home and work, home and church, and school and neighborhood. This may

include the relationship between work stress and its impact on life at home or vice versa. For

instance, the amount of mandatory overtime at work due to low employment rates can impact

operators' home lives negatively. These disturbances may affect quality of sleep, such as by

causing insomnia and ongoing nightmares (Adams et al., 2015). Restful sleep is important to

survival and a lack of this impacts bodily systems as well as cognitive and behavioral

performances (Noronha Liberalesso et al., 2012).

The exosystem level refers to external environments in which a person does not

participate, but through which significant decisions are made by others who directly interact with

that person (Bronfenbrenner, 1979; Voydanoff, 2001). An example of this can be seen in the

decisions made by government affecting government jobs such as operators. Specifically, the

current pay wages for these employees are low, with the average wage across the U.S. being

about $22 per hour (Salary.com, 2019). Likewise, retention rates in this field impact these

employees. For instance, Arias (2018) reported 2013 data from an Emergency Communications

Center located in Maryland: 301,000 phone calls were answered and 160,000 were dispatched

calls with 43 staff working the floor. The following years, these numbers spiked to 470,000 calls

and 277,000 dispatches, but the number of employees had reached only 50 (Arias, 2018). Lastly,

these are important variables to consider, as a 911 call center study indicated that after poor

salaries, shift work leading to stress and burnout was the second most important factor behind

turnover for a 911 call center (Taylor et al., 2005).

The last ecological level is the macrosystem, which represents the "blueprints" for

defining and organizing the institutional life of society (Bronfenbrenner, 1979). Examples of

this level are ideology, social policy, shared assumption about human nature, the "social

contract," and economic resources. For operators, overall overtime pay was estimated at

$205,000 in the 2017 fiscal year for this department (Arias, 2018). This estimated cost of overtime pay may impact taxpayer dollars. Additionally, requests for additional staff are not always fulfilled due to budget cuts (Arias, 2018), which are seen in the macrosystem. This inability to provide more staff or higher pay impacts retention rates in this field. Low staffing may serve as a barrier to providing quality emergency services, as operators are asked to take on more shifts that may impair their sleeping or other overall functioning, which may impact level of cognitive processes needed to perform well in this job. Because of possible impairments in their functioning and skills, operators are more likely to make mistakes such as missed or dropped 911 calls, which have increased in recent time (Arias, 2018). The failure to answer emergency called may negatively impact people's beliefs that the department provides quick emergency service.

According to Lewis and Cooper (1999), these interrelationships are most evident in a work environment where changes occur, such as downsizing and restructuring, increased job security, changes in the psychological contract between workers and employers, a reliable workforce, and a long-hours culture. Due to high stress and long hours, such as in operators' work, job security is not likely (Petty, 2012).

EST is helpful in understanding interrelationships among work, community, and family domains (Voydanoff, 2001). This ecological framework conceptualizes how different variables and their relation across systems influence overall individual functioning. For this reason and due to the multiple factors being addressed in this study, EST was one of the theories used to conceptualize how social support, coping style, and sleep impact the presence of psychopathology in operators.

Self-Efficacy Theory

Individual's beliefs about their ability to produce effects is referred to as perceived self-efficacy (Bandura, 1994). These beliefs influence how people feel, think, behave, and motivate themselves. There are four major processes involved in this belief system: cognitive, motivational, affective, and selection (Bandura, 1994). Overall, having a strong sense of self-efficacy influences personal well-being, as it impacts not only how individuals see themselves, but also how they see the world and its challenges. Bandura (1994) offers the following examples when discussing those who have a strong sense of self-efficacy: "They quickly recover their sense of efficacy after failure or setbacks . . . They attribute failure to insufficient effort or deficient knowledge and skills which are acquirable" (p. 2).

Self-efficacy is developed by several sources and experiences (Bandura, 1994). Successful experiences, or mastery experiences, create a belief that one is valuable. Operators who find they are successful at their job are able to provide efficient emergency responses, balance work and life stressors, and may arguably have high self-efficacy. Observing people who are similar to oneself succeed by using their effort and abilities makes individuals feel they can be successful, too. Operators who see peers cope effectively with work stressors through the use of social support or therapy may then believe they can become successful in managing stressors, which would improve self-efficacy. The same can be said for operators seeing peers coping poorly with work and trauma-related stressors. When operators see peers' difficulty in coping and how it can impact work performance, it may negatively impact their own self-efficacy. In other words, operators' self-efficacy may be impacted when they believe they too cannot cope with these stressors if their peers are failing to cope positively. For example, an operator observes a peer unable to cope well with work stressors, not because of lack of effort,

but perhaps due to ineffective coping style, which results in poor work performance. That observer may believe that the operator tried his or her best to cope and failed. Therefore, through a vicarious process, this experience negatively influences the observer's appraisal of his or her own self-efficacy.

Social persuasion is another way to increase self-efficacy (Bandura, 1994). Those who are told they are capable of doing things are more likely to use and sustain efforts until they succeed, demonstrating greater self-efficacy. Operators who have a strong support system or a positive work environment may be more likely to receive feedback related to their capabilities, which would then improve their self-efficacy.

Lastly, a sense of self-efficacy is impacted by how individuals perceive their somatic and emotional reactions. That is, those who have a high sense of efficacy perceive their affective state of arousal as a way to improve their performance rather than impede their performance. For example, if operators start to experience physical or emotional responses such as an adrenaline rush while at work and perceive it as way to remain alert, it can improve their performance. In contrast, being overwhelmed by this adrenaline rush may hinder their performance. Having a sense of self-efficacy is useful in decreasing depression and anxiety (Maciejewski et al., 2007). Therefore, individuals who do not believe in their capabilities as they relate to their self-efficacy are more vulnerable to stress and depression (Bandura, 1994).

As noted, self-efficacy relates to how individuals view themselves and their abilities; therefore, it influences personal well-being. As such, this theory was also used to conceptualize how the proposed factors of social support, coping style, and sleep influence psychosocial functioning.

Psychosocial Functioning

Posttraumatic Stress Disorder (PTSD)

In order to meet diagnostic criteria for PTSD, symptoms of reexperiencing, avoidance, negative cognition and mood, and arousal must be present (APA, 2013). The individual must have some level of exposure to actual or threatened death, serious injury, or sexual violence. He or she must demonstrate intrusive symptoms related to the event such as intrusive memories, distressing dreams, or flashbacks. He or she must also engage in persistent avoidance of stimuli associated with the event, either internal reminders such as distressing memories or external cues such as places. The individual must display negative alterations in cognitions or mood related to the event, such as exaggerated negative beliefs or expectations about oneself, others, or the world. The individual must have marked alterations in arousal and reactivity related to the traumatic event, such as hypervigilance or sleep disturbance. Finally, these symptoms must be present for more than 1 month and cause clinically significant distress in social, occupational, or other important areas of functioning. A more thorough list of criteria can be found in the *DSM-5* (APA, 2013).

Etiological Models. Etiological models of PTSD vary and differ from each other based on how social support is perceived to help or hinder an individual. Regardless of these subtle differences, the major contribution of these models is how an individual's cognitive, behavioral, and emotional processes relate to his or her psychosocial functioning. An etiological model of PTSD by Joseph et al. (1997) purported that other people's points of view can positively or negatively influence a victims' interpretation of events, impacting PTSD symptoms (Guay et al., 2006). In this model, the search for support in the environment was defined as an active stress management strategy, whereas the support received from or perceived to be received from

significant others is a factor that may lower or exacerbate stress levels (Williams & Joseph, 1999).

Another proposed etiological model of PTSD identified the nature and quality of social interactions contributing to the frequency of intrusive thoughts that maintain repeated responses to traumatic events and one's tendency to avoid disclosing or thinking about an event (Lepore, 2001). Others suggest that social support impacts PTSD symptomatology through its influence on the victim's interpretation of the event (Guay et al., 2006). The interpretation of the event, held in memory, provides the basis for reexperiencing symptoms in PTSD (Guay et al., 2006). Williams and Joseph (1999) stated that these memories influence thoughts about the event and its meaning as well as reappraisals of the event (Williams & Joseph, 1999). The major contribution of the models discussed is the explanation of how social support acts upon cognitive, behavioral, and emotional processes related to most of the diagnostic criteria of PTSD in the *DSM-5* (Guay et al., 2006).

Prevalence. The APA (2013) reported the rate of PTSD for adults is 3.4% over a 12-month period, and the projected lifetime risk by age 75 is 8.7%. In regard to how occupation can impact rates of PTSD, the APA found high rates of PTSD in occupations that have increased risk of traumatic exposure. Emergency services professions report prevalence rates much higher than the national average (APA, 2013), with rates within first responders reportedly between 5% and 32% (Klimley et al., 2018). Moreover, studies on 911 operators have reported prevalence rates of PTSD symptoms to be around 24.6% to 30.8% of their samples (Dicks, 2014; Pierce & Lilly, 2012).

PTSD in Operators. The largest rates of PTSD could be expected in populations that are at close proximity to the most extreme of traumatic stressors, such as emergency services

workers (Scully, 2011). According to the *DSM-5's* Criterion A4 for PTSD, operators'

experiences would qualify them for a diagnosis of PTSD because they are exposed to duty-

related aversive details of traumatic events (APA, 2013; Pierce & Lilly, 2012). Developing

PTSD may be related to hearing a critical incident and not solely by viewing it in person (Brunet

et al., 2001).

Operators reported experiencing fear, helplessness, or horror in reaction to 32% of

different types of emergency calls experienced (Pierce & Lilly, 2012). Operators also expressed

feelings of powerlessness, failure to save lives, or failure to control situations, which were

experienced through ongoing nightmares, insomnia, drug and alcohol use, shutting down

emotionally, numbness, hyperarousal, and isolation (Adams et al., 2015). Individuals who

described having these intensely negative emotional responses during or immediately after

traumatic events reported higher levels of PTSD symptoms or rates of current PTSD (Brewin et

al., 2000). Although operators may not be physically present at a traumatic event, nor have a

personal relationship with the victim, exposure to duty-related aversive details can be sufficient

to induce PTSD symptomatology that is severe enough to be consistent with a probable diagnosis

(Pierce & Lilly, 2012).

Prevalence in Operators. Pierce and Lilly (2012) used the Potentially Traumatic

Events/Calls measure, which assesses career exposure to types of potentially traumatizing 911

calls. They also looked at the frequency of those calls. Out of 171 participants, 32% of them

reported experiencing fear, helplessness, or horror as a reaction to different calls. Notably, they

compared their peritraumatic distress scores of operators to Brunet and colleagues' (2001) police

officer and civilian sample. Peritraumatic distress differs from PTSS and PTSD. Peritraumatic

stress is solely the negative emotions experienced during or immediately after a traumatic event

(Brunet et al., 2001). In contrast, PTSS are more specific negative emotions related directly to diagnostic criteria seen in PTSD. Moreover, in order to be diagnosed with PTSD, the duration of the symptoms must be present for at least 6 months (APA, 2013).

Pierce and Lilly (2012) found that operators reported experiencing peritraumatic distress in reaction to a variety of different emergency calls. The peritraumatic distress scores were significantly correlated with PTSD (Pierce & Lilly, 2012). Specifically, 3.5% of their participants scored at or above the cutoff score of 28, indicating PTSD (Pierce & Lilly, 2012). It was later reported that the corrected prevalence rate for PTSD within this study was 9.7% (Lilly, 2014). They acknowledged operators' scores may partly be due to the sample being predominantly women, who generally endorse greater peritraumatic distress than men (Creamer et al., 2005). Nevertheless, the finding of increased levels of peritraumatic stress and its connection to PTSD is noteworthy in that this present study may help support the presence of PTSS in operators.

Depression

Depression is characterized by demonstrating a depressed mood (i.e., feeling sad, empty, hopeless) or loss in interest for more days than not (APA, 2013). A full list of diagnostic criteria for this disorder can be found in the *DSM-5* (APA, 2013). The prevalence rate for depression in the United States is approximately 7% (APA, 2013). Not much is known regarding prevalence rates of depression in 911 operators; however, studies have shown prevalence rates for depression to be about 7% to 22% in first responders (Jones et al., 2018), though that study did not include operators.

Depressed individuals tend to attribute negative intentions to the behavior of significant others (Horneffer & Fincham, 1995), which can lead to an under-evaluation of support received

or, alternatively, perceive support negatively (Guay et al., 2006). In this instance, social support

may be of significant importance when considering operators' psychosocial functioning.

In the National Comorbidity Survey–Replication, 42.8% of individuals with PTSD also

had major depressive disorder (Rojas et al., 2014). Flory and Yehuda (2015) posited that, in

general, nearly half of those with PTSD have comorbid depression. Two theories can be applied

to explain the high rates of comorbidity between PTSD and depression. The first theory is that

there is a diagnostic symptom overlap between these disorders and that they may appear to be

comorbid because of a vague classification of shared symptoms (Flory & Yehuda, 2015). Yet,

there is little research to support this theory (Flory & Yehuda, 2015). The second and more

supported theory in the literature views depressive comorbidity as a trauma or stressor-related

presentation secondary to PTSD symptoms. In other words, PTSD with comorbid depression

may be seen as a subtype of PTSD rather than a separate diagnosis altogether. This comorbidity

supports the importance of investigating depressive symptoms in this population.

Psychosocial Risk and Protective Factors

Social Support

Social support is a social process that involves meaningful connections to others and is

important in various life domains such as day-to-day living and illness management (Chronister

et al., 2015). Kondrat et al. (2018) argued that social support is "intricately and intimately" tied

to mental health (p. 306). Using social support is seen as an active coping strategy to handle

negative life events, which is associated positively with reframing negative events into positive

events (L. Davis & Brekke, 2014). Positive reappraisal is associated with intrinsic motivation

and strong role functioning (Kondrat et al., 2018). Cognitive restructuring is considered a

successful strategy, along with expressing emotions and seeking social support, for recovery and diminished PTSD symptoms over time (Gutner et al., 2006).

Social support is categorically either structural or functional. Structural social support encompasses objective characteristics such as quantity, whereas functional social support focuses on the specific resources that provide support such as emotional (nontangible and instrumental) or tangible (Semmer et al., 2008). Specifically, nontangible support communicates caring, empathy, and esteem, whereas the tangible support relates to assistance in problem-solving through help or information (Semmer et al., 2008). Although both types of supports can be beneficial for overall functioning, given the nature of operators' job, having nontangible support can be extremely helpful in their ability to effectively process traumatic events and help maintain their self-efficacy.

Henderson (1992) found an inverse relationship between social support and depression. Not having social support limits individuals from having instrumental and emotional forms of support (Kondrat et al., 2018). Instrumental support communicates to recipients that they are cared for and accepted. This acceptance provides a basic need of belonging as they feel less isolated in their struggles to come to terms with their experiences (Semmer et al., 2008). Social support has also been related to the diagnosis of PTSD and is considered one of the most important precursors in its development (Guay et al., 2006). That is, negative social support, or lack of support, is related to a higher likelihood of developing PTSD, whereas positive social support is associated with lower rates of PTSD. Other findings suggest that social support not only contributes to developing PTSD, but also to its maintenance (Schnurr et al., 2004). A model explaining the relationships between social support and PTSD theorized poor social support is

related to increased PTSD symptoms primarily through cognitive processes that result from unprocessed trauma-related thoughts and emotions (Joseph et al., 1997).

Further research has supported these findings that social support from others may have an impact on the person's emotional states such as panic and guilt, as well as coping strategies such as the degree of avoidance of thoughts or behaviors related to the traumatic event (Williams & Joseph, 1999). For example, supportive and receptive responses to disclosures of traumatic events are seen as helpful, whereas unsupportive and unreceptive responses have a negative impact on emotional adjustment after traumatic events and increase levels of psychological distress (Lepore et al., 1996). Emotional nontangible kinds of positive social support encourage individuals to use supportive persons to gather advice or alternative interpretations in a way that can help them assimilate the event, which helps them gain control over negative emotions (Leopore, 2001; Lepore & Greenberg, 2002). When individuals do not assimilate traumatic events, they are at increased risk for developing PTSD (Schnurr et al., 2000).

Due to the nature of operators' jobs, the inability to regulate their workload, having to work under constant temporal pressure, and having no feedback regarding caller outcome, emotional stress is an intrinsic part of the job (Wiebel et al., 2003). Having this emotional stress as part of their job, it is important that operators are coping well, which includes having social support. Unfortunately, operators may at times have difficulty with and shame about dealing with work stress alone. This occurs because operators may feel the need to shield family members and other supports from the traumatic incidents they witness at work (Dicks, 2014). Operators who have positive supportive social networks and family systems have less work-related stress over those who do not, despite having the exact same lack of a supportive working environment (Burke, 1995). Negative response and dissatisfaction with support because of

perceived lack of availability of others, inability to confide in others, lack of emotional or practical support, and negative responses from others was significantly associated with the development of PTSD symptoms (Brewin et al., 2000).

In considering social support within this population, the helping behavior associated with reassurance of worth was significantly associated with lower levels of depression (Cutrona & Russell, 1987). Nontangible positive support, such as talking and providing emotional care, has beneficial effects under conditions of stress (Cutrona & Russell, 1987). Receiving positive feedback from supports provides reassurance of worth and contributes to self-efficacy (Bandura, 1994). Those who report lower levels of perceived social support after traumatic events report higher levels of PTSD symptoms (Ozer et al., 2008). Support from others may also have an impact on a person's emotional states (fear, panic, grief, guilt, and shame) and coping strategies (i.e., degree of avoidance of thoughts and behaviors directly or via reappraisal mechanisms; Williams & Joseph, 1999).

Coping Style

High levels of stress can place a high burden on physical and mental systems (Eriksen et al., 1999; Sapolsky, 1996). Therefore, coping style is important to consider, as coping style may promote psychological well-being. Efficient and adaptive coping skills have been found to buffer PTSD symptoms (Schnider et al., 2007) and depressive symptoms (Yan & Wang, 2005) during stressful times. Therefore, ineffective and maladaptive coping styles may lead to perceived personal failure and distress (Yan & Wang, 2005). Most coping responses encompass problem- or emotion-focused coping (Carver & Scheier, 1994; Folkman & Lazarus, 1985).

Problem-focused coping is seen as an adaptive way of coping as it involves actively engaging in behaviors that help overcome the issue causing distress (Folkman & Lazarus, 1985).

Emotion-focused coping involves ways individuals try to regulate their emotions and can be

considered active or avoidant (Holahan & Moos, 1981). Active emotional coping (e.g., venting

to a support person or cognitively reframing a stressor's impact) is seen as an adaptive emotion-

regulation strategy (Folkman & Lazarus, 1985), whereas avoidant emotional coping, such as

denial or distraction without problem-focused behavior, is seen as maladaptive way of coping

(Holahan & Moos, 1981). Approach is seen as an active, positive coping style and avoidance, as

a passive, negative one. It is important to note that these views of coping may be more aligned

with Eurocentric view of coping and may therefore differ for those of different racial, ethnic,

cultural, and gender backgrounds.

Approach Coping. Approach coping is often referred to as attention, sensitization,

monitoring, engagement, or vigilance, consisting of an individual's thoughts or actions following

a perceived stressful event, with the intention of reducing or managing the unpleasant experience

(Anshel, 2000). Others characterize approach coping as cognitive and emotional activity

oriented toward threat (Roth & Cohen, 1986) or strategies characterized by intensified intake and

processing of threatening information (Krohne, 1993).

Avoidant Coping. Avoidant coping strategies are related to PTSD symptoms (Ullman et

al., 2007). Avoidance coping consists of physically removing oneself from a perceived threat

(e.g., exercising, walking away), filtering out or ignoring information, discounting the relevance

or meaningfulness of potentially stressful input (e.g., not taking it seriously), or psychologically

distancing oneself from the stressor (Anshel, 2000; Krohne 1993; Roth & Cohen, 1986). This

coping style is also referred to as desensitization, distraction, repression, blunting, non-vigilance,

passive, or disengagement coping (Anshel, 2011). Engaging in attempts to avoid or reduce

negative affect is a common response to stressful life events, but it can be ineffective and

maladaptive (Littleton et al., 2007). Although avoidance may protect individuals from the

immediate trauma, it may hinder recovery, as it is required to face the trauma and its effects in

order to process trauma and related symptoms (Littleton et al., 2007).

 Emotion-Focused Coping. Emotion-focused coping behaviors involve consciously

attempting to alter or avoid an emotional reaction to a situation, whereas problem-solving

behavior focuses on action and solutions for the situation at hand (Folkman & Lazarus, 1985).

Emotion-focused forms of coping in adulthood have been linked recurrently to negative

outcomes such as PTSS following trauma (Hassija et al., 2012; Lilly & Graham-Bermann, 2010).

These strategies promote and maintain avoidance, a behavior associated with a lack of adequate

trauma processing and the development and maintenance of many PTSS symptoms such as

hypervigilance and nightmares (Ehlers & Clark, 2000; Littleton et al., 2007).

 Importance of Coping. Coping methods are a highly salient behaviors to study in

operators given the continual nature of potentially disturbing calls and the necessity to put

personal reactions aside to perform their duties (Allen et al., 2016). An operator uses skills to

assess an incident, secure the emergency scene, and send appropriate help within minutes.

Crucial to this success is remaining calm and suppressing emotional reactions (Pierce & Lilly,

2012). Nevertheless, operators experience chronic and acute forms of stress ranging from sleep

deprivation to poor relationships (Anshel et al., 2013). Arguably, impairments in their

psychosocial functioning may negatively impact operators' ability to remain calm and use

executive functioning needed to stay in control and fulfill their work responsibilities.

 Elevated rates of PTSS was found in a sample of 171 dispatchers (Allen et al., 2016). Of

this sample, 17.6% exceeded a cutoff score of 50 indicating probable PTSD. It is important to

note that childhood exposure to trauma was significantly associated positively with emotion-

focused coping strategies. Specifically, emotion-focused behaviors were associated positively with PTSS. Only emotion-focused strategies accounted for the association between childhood trauma exposure and PTSS. Positive appraisal of events, as seen in active emotion-focused coping, was related inversely to PTSS. Emotion-focused coping strategies might then be effective in the moment as telecommunicators complete their work duties but may also present as a risk factor for psychopathology in the long-term. Overall, workers exposed chronically to trauma in their field of work may benefit from learning more effective and adaptive coping strategies (Allen et al., 2016).

In their qualitative study, Adams et al. (2015) interviewed 16 dispatchers with the aim of understanding their experiences at work and gathering information on how best to promote mental health and well-being in this population. Results suggested that the use of cognitive reappraisals were helpful in coping with daily calls involving trauma and crises. Specifically, reappraisals helped workers to construct new, more meaningful narratives and assist in making sense of their emotions, role, and relationships with callers, which helped their overall posttraumatic growth.

Posttraumatic growth (PTG) refers to the positive psychological growth demonstrated after experiencing a traumatic or extremely highly stressful event (Tedeschi & Calhoun, 2004). This positive growth is demonstrated in a person's resilience or return to a baseline level of functioning (Brooks, 2018). In other words, PTG is not the individual's return to normalcy after the experienced event, but rather growth in different areas (Tedeschi & Calhoun, 2004). Furthermore, Brooks (2018) noted that individuals with PTG typically develop new perspectives about themselves and their worlds. Brook stated that this new perspective gives individuals meaning and purpose.

In their sample, Adams et al. (2015) found individuals use these new narratives to adapt to their role as dispatchers. Therefore, when operators engage in the use of reappraisals to cope, PTG may be likely and can be seen in their increased appreciation and value of their own lives and other behavioral changes embracing new values (Adams et al., 2015). Furthermore, these narratives are strengthened and maintained by using strategies such as self-care, support, humor, and reflection (Adams et al., 2015). All of the aforementioned strategies may considerably impact an individual's psychosocial functioning. Therefore, when an operator's psychosocial functioning is poor, he or she may not engage in the previously noted healthy behaviors that would lead to PTG. Instead, he or she may cope ineffectively and experience negative reactions such as depression and PTSD.

Sleep

Another variable that was assessed in regard to its impact on psychosocial functioning within operators is sleep. Noronha Liberalesso et al. (2012) explained that "sleep is a reversible state of consciousness characterized by the temporary suspension of perceptual/sensory phenomena and voluntary motor activity that naturally occurs at regular intervals, alternating with wakefulness" (p. 1). Sleep is vital to survival because of its restorative effects. Therefore, it is not surprising that a reduction in the amount of sleep one has impacts bodily systems (Noronha Liberalesso et al., 2012). Sleep loss has also been found to heavily influence cognitive impairments and behavioral performance (Ellenbogen, 2005). Prolonged wakefulness has been argued to impair fundamental waking functions such as attention, learning, sensorimotor integration, and a range of executive functioning (Ellenbogen, 2005).

Sources of disturbed or shortened sleep include the effects of work life (Åkerstedt, 2003; Härmä et al., 1998). Mental and physical efforts at work predict disturbed sleep better than any

objective indicators (Marquié et al., 1999). Studies have found that shift work, a long working week, and the urge to do things quickly at work appeared to be the main risk factors controlling for age and gender when it comes to sleep (Ribet & Derriennic, 1999). Furthermore, Theorell et al. (1988) found a relation between increasing job strain, the combination of high psychological demands and low decision latitude (a lack of authority to make important decisions), and sleep. In fact, a probable mediator of effects on stress and sleep was thought to be an inability to free oneself of thoughts of work during leisure time (Åkerstedt et al., 2002). Lastly, the most obvious link between work factors and disturbed sleep was that of working under high demands (Åkerstedt et al., 2002). Dicks (2014) found that 53% of the operators reported having trouble falling or staying asleep. Issues impacting sleep were feelings of powerlessness and failure to save lives or control situations, which were experienced through ongoing nightmares and insomnia (Adams et al., 2015).

      Shift Work. Operators' long, overnight, and often mandatory shift schedules have been addressed previously. According to Åkerstedt (2003), shift workers report more sleep disturbances than day workers. Åkerstedt also found that irregular work hours, in comparison to regular morning and night work, has strong, acute effects on sleep and alertness. Low quality sleep and impairment in alertness impact days working and also off days, making this a chronic issue for shift workers. Although sleep disturbances occurring from shift work have not been found to have clear indication for chronic insomnia, it is very similar and is responsible for considerable human and economic costs due to fatigue-related accidents and reduced productivity (Åkerstedt, 2003). Finally, Åkerstedt (2003) posited that the mechanism behind sleep disturbances for shift workers is the sleep-interfering properties of the circadian system during daytime sleep hours and the sleep-promoting properties during night work.

Impact of Work on Sleep. One source of disturbed or shortened sleep is the effects of

work life (Åkerstedt, 2003; Härmä et al., 1998). Operators have high work demands that predict

poor sleep quality (Åkerstedt et al., 2002). Operators experience increased adrenaline and HPA

axis activity because they need to be alert at all times, as they are expecting and trying to prevent

the worst (Weibel et al., 2003). This increased HPA axis activity can become difficult to shut off

at the end of a shift and can cause sleep disturbances. Living in this state of adrenaline rush can

lead to mental and physical health problems (Dicks, 2014). According to McEwen (2006), some

of these health problems related to the hyperactivity of the HPA axis can be seen in sleep

deprivation. McEwen stated that sleep deprivation can lead to high blood pressure and cognitive

impairment, which can contribute to unhealthy lifestyles. In McEwen's study looking at

increased HPA axis activity in animals found atrophy in the hippocampus and prefrontal cortex,

related to decreased selective attention and executive functioning. These brain impairments can

lead to damages in the amygdala, which is used in fear and anxiety responses as well as

aggression (McEwen, 2006).

Work Environment

Within the culture of first responders it is critical that the atmosphere be compassionate,

empathetic, and helpful in order to provide necessary support to the professionals who face

traumatic incidents during the course of their duties (Robinson-Kitt, 2009). Payne (1993)

posited that operators function in a work environment that produces a hierarchical culture

between "on scene" workers and those who are considered "clerical" (i.e., operators). Payne

stated that the lack of balance between operators and police officers as a team inhibits their

ability to function at optimal levels (referred to it as "role disequilibrium," p. 111). Lack of

social support at work was a risk indicator for not feeling rested, difficulties awakening, and

disturbed sleep (Åkerstedt et al., 2002). Even with these health-related impairments due to work

environment factors, the work environment does not acknowledge the need for mental health

treatment and, in fact, stigmatize those who seek it (Levenson, n.d.; Robinson-Kitt, 2009). This

further supports the need for continued research within this population to help improve mental

health interventions for operators.

CHAPTER 3: METHOD

Overview

The purpose of the present study was to explore the impact of social support, coping style, and sleep as they relate to the presence of PTSS and depression in 911 operators. This study employed an anonymous, online survey.

Design

This observational, cross-sectional design used multiple linear regression models to determine the effects of social support, coping style, and sleep on PTSS and depression for the aforementioned population. Multiple linear regression models were used, as this study evaluated the relationship between multiple predictor variables (social support, coping style, and sleep quality) and the outcomes of PTSS and depression. The assumptions of multiple regression (linearity, normality, homoscedasticity, and multicollinearity) were assessed, and outliers were identified using histograms, scatterplots, Shapiro-Wilk tests, variance inflation factor (VIF) checks, and Pearson correlations. The variables of interest were examined through SPSS 24.0. The first power analysis was conducted for Pearson correlation analysis at 80% power at the .01 level of significance for a small effect size, yielding a need for 120 participants. The analysis included a medium effect size of .39, which is a conventional standard (Cohen, 1992).

Participants

In total, 201 individuals completed the survey screening questions. Of the 201 potential participants, 143 met the inclusion criteria of current employment as a 911 operator or dispatcher in the United States and answering emergency telephone calls. Of these 143 participants, 133 individuals completed the trauma symptoms measure, 131 completed the depressive symptoms measure, 140 completed the social provisions measure, 142 completed the coping style measure,

and 127 completed the sleep quality measure (Table 1). Participants' responses were included in

the analyses if measures necessary for each hypothesis were completed.

Inclusion Criteria

In order to meet inclusion to participate in this study, a few criteria needed to be met.

Participants needed to be 18 years or older. They needed to be employed currently as 911

operators or dispatchers for a minimum of 20 hours per week. They were required to actively

answer 911 calls.

Exclusion Criteria

Individuals were excluded from participation if they were not currently actively

answering emergency phone calls (e.g., managers, supervisors).

Table 1

Measure Completion

Measures	Frequency
PCL-5	133
PHQ-9	131
SPS	140
CSIF	142
PSQI	127

Recruitment

Participants were recruited from public and private Facebook groups directed toward operators and dispatchers using IRB-approved posts and ads (see Appendix). Additionally, the researcher reached out to national associations for these groups to access members for participation in this study. Appropriate Facebook groups were identified using "dispatcher" and "911 operators" as search terms, which resulted in the location of six potential group sites. The administrators of the relevant groups were contacted to provide information about the purpose of the study and participation requirements, and were asked permission to post the study's information on their sites. The number of individuals in these groups ranged from 20,000 to 25,000 per site. Following IRB approval, the posts were refreshed every 3 weeks until recruitment was completed. The researcher also reached out to national associations for operators and dispatchers to request permission to access their list servers; however, permission was never received in order to contact their members.

Measures

Demographic Questionnaire

Participants were asked to complete a demographic questionnaire inquiring about age, biological sex, race/ethnicity, and years of experience as operators or dispatchers.

Post-Traumatic Stress Symptoms

The Posttraumatic Stress Disorder Checklist for *DSM-5* (PCL-5) is a 20-item self-report measure that assesses the diagnostic symptoms of PTSD (Weathers et al., 2013). This measure can be used to screen individuals for PTSD as well as to make a provisional PTSD diagnosis. This self-report tool uses a 5-point Likert scale ranging from a 0 ("Not at All") to 4 ("Extremely") to indicate how much the individual has been bothered by each symptom in the

past month. A total symptom severity score ranges from 0 to 80. In order to use the total PTSD

symptom severity score as a screening tool to determine if an individual has symptoms severe

enough to be considered experiencing PTSS, a cut point is necessary. Pierce and Lilly (2012)

used a cut point of ≥ 28 in their first study with 171 participants, as did Dicks (2014) with an

146 participants. According to the National Center for PTSD (2018), "a lower cut-point is

considered when screening for PTSD or when it is desirable to maximize detection possible

cases" (p. 2). Given the lack of information on the presence of PTSS in operators and the

intention to include all possible cases without the use of a clinical interview, a cut point of ≥ 28

was utilized for all data analysis. In doing so, results of this study can be compared to studies

that have used this cut off point (Dicks, 2014; Pierce & Lilly, 2012)

Overall, the PCL-5 demonstrated excellent reliability and validity with the following

psychometrics: strong internal consistency (α = .94), test-retest reliability (r = .82), and

convergent (rs = .74 to .85) and discriminant (rs = .31 to .60) validity (Blevins et al., 2015).

Depression

The Patient Health Questionnaire (PHQ) is a self-administered questionnaire that assesses

for a variety of diagnoses (Kroenke et al., 2016). A shortened version, the PHQ-9 is comprised

of the depression module taken from the PHQ (Spitzer, 1999; Spitzer et al., 1999). In this

questionnaire, depression is diagnosed when five or more of the nine symptom criteria have been

present at least "more than half the days" within the past 2 weeks, and one of the symptoms is

depressed mood or anhedonia. Other depression is diagnosed when between two and four

symptoms have been present at least "more than half the days" in the past 2 weeks with

depression or anhedonia being present. Clinicians reviewing this questionnaire should rule out

any physical causes of depression, normal bereavement, and history of a manic episode. The

severity measure ranges from 0 to 27, with anchors being 0 ("Not At All") to 3 ("Nearly Every Day"). A qualitative item is asked of those who endorsed any of the items on the questionnaire prompting: "How *difficult* have these problems made it for you to do your work, take care of things at home, or get along with other people?" (Kroenke et al., 2016). Psychometrics have shown internal reliability with a Cronbach's alpha of 0.89 in the PHQ Primary Care Study (Kroenke et al., 2016). Test-retest reliability was also found to be excellent, with a 0.84 correlation between separate administrations. Criterion validity found the PHQ-9 was able to discriminate well between persons with and without major depression (Kroenke et al., 2016).

Social Support

The Social Provisions Scale (SPS) was created to measure perceived social support (Cutrona & Russell, 1987). This measures is based on six dimensions of social support that are functionally different types of support: attachment (feelings of safety and security in a close emotional bond), social integration (interests and concerns are shared by others), reassurance of worth (skills and abilities are acknowledged and valued by others), reliable alliance (the assurance that tangible assistance is available if needed), guidance (the availability of authoritative others to provide advice), and opportunity for nurturance (the sense of being needed in vital ways by other person; Cutrona & Russell, 1987). Respondents use a 4-point Likert scale ranging from 1 ("Strongly Disagree") to 4 ("Strongly Agree"). Russell and Cutrona (1987) reported internal consistency ranging from .76 to .84 in a sample of older adults and from .61 to .76 in a sample of teachers. The test-retest reliability coefficients ranged from .37 to .66 for the subscale and was .59 for the total scale in a sample of elderly community residents. A confirmatory factor analysis indicated a goodness of fit of .86 for the six-factor model. There

have been several studies of individuals undergoing stressful life events showing evidence of

validity (for a review, see Cutrona & Russell, 1987).

Coping Style

The Coping Strategies Inventory Short-Form (CSI-SF; Addison et al., 2007) was created

based off of the Coping Strategies Inventory (CSI; Tobin et al., 1989). The CSI was originally

created as a 78-item questionnaire that used a Likert scale. Participants rated the general

frequency that they utilize each listed coping strategy on the survey and indicated their choices

using 1 = "Never," 2 = "Seldom," 3 = "Sometimes," 4 = "Often," and 5 = "Almost Always"

(Tobin et al., 1989). This measure was then shortened to a 16-item version after the validity of

the measure was determined (Addison et al., 2007). The CSI-SF was developed to reflect the

original scale, with four 4-item subscales: (a) Problem-Focused Engagement, (b) Problem-

Focused Disengagement, (c) Emotion-Focused Engagement, and (d) Emotion-Focused

Disengagement (Tobin et al., 1989). The use of the 16-item CSI-SF was found to meet

minimum psychometric requirements for measuring coping (Addison et al., 2007). Furthermore,

Addison et al. (2007) found that item 16 was a poor performing item through the process of

psychometric analysis. Addison et al. established the usefulness of the four-factor 15-item CSI-

SF as a measure of coping in African Americans; providing empirical support for utilizing it in

future research to understand the role of coping in moderating health outcomes.

Sleep Quality

The Pittsburg Sleep Quality Index (PSQI) is a self-report questionnaire that measures

sleep quality and quantity (Buysse et al., 1989). The original version was created to measure

sleep reports over a 1-month interval (Buysse et al., 1989). The 19-item self-report questionnaire

yields seven component scores: subjective sleep quality, sleep latency, duration, habitual sleep

efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction. Participants' bed partners are asked to respond to additional questions, although these questions are not scored (S. L. Beck et al., 2004). The Global Sleep Quality scale was found to have a Cronbach's alpha of 0.83 (S. L. Beck et al., 2004). A Global Sleep Quality score greater than 5 discriminated between good and poor sleepers and yielded a diagnostic sensitivity of 89.6% and specificity of 86.5% (Buysse et al., 1989, Buyssee et al., 1991). Several studies have provided evidence of the reliability and validity of the PSQI in different populations, such as bereaved spouses (Reynolds et al., 1993), patients with AIDS (Rubinstein & Selwyn, 1998), panic disorder (Stein, Chartier, & Walker, 1993), and social phobia (Stein, Kroft, & Walker, 1993).

Procedure

Participants were recruited using the above-mentioned procedure. The researcher posted a brief blurb on the identified Facebook groups about what school the researcher attends, what the study was about, inclusion criteria, what participation would consist of, ensuring anonymity, the expected duration of participation, and how participants were to be compensated for their time. Potential participants who clicked on the study link were directed to the REDCap survey, a secure web application for building and managing online surveys and databases. The first study page included information on the study, estimated duration of the survey, raffle information, and the anonymous and voluntary nature of participation. Participants were then asked to answer several screening questions to confirm eligibility, and to click a box that they understand the voluntary, anonymous nature of the survey and agreed to participate. Participants who agreed and met criteria then began the survey questionnaires, which were estimated to last 20 minutes (demographic information, social support, coping style, sleep, depression, and PTSS).

Participants who endorsed high depression, suicidality, or PTSS were provided information on mental health resources. Individuals who completed all requirements were entered in a raffle for one of two $30 Visa gift cards by entering their contact information into a separate web server to ensure the confidentiality of participant answers. The student researcher then downloaded data via REDCap online, scored assessments, and exported data to SPSS (IBM version 24.0) for analysis.

CHAPTER 4: RESULTS

Statistical Analyses

Pearson correlation analyses and multiple regression analyses were performed to determine relationships between PTSS, depression, nontangible social support, emotion-focused disengagement coping style, and poor sleep quality. Demographic questions were included to asses for age, gender, race/ethnicity, and number of years in the field.

Demographic Data

The majority of participants were female (86.8%) and White/European American (90.3%), with an average age of 41.36 years ($SD = 11.81$). The remainder of the participants identified as "other race" (4.9%), Black or African American (1.4%), American Indian or Alaska Native (0.7%), or preferred not to disclose (2.1%). Additionally, 89.6% identified as Non-Hispanic, and 7.6% were Hispanic or Latinx. Years of experience in this occupation varied slightly, with the majority of participants reporting five years' experience (68.1%). Others' experience in the field ranged from 1 to 5 years (20.8%) to less than 1 year (10.4%). Demographic characteristics are found in Table 2.

Table 2

Characteristics of 911 Operator and Dispatcher Survey Respondents (N = 143)

Variable	Frequency	Percent	*M (SD)*
Age (years)			41(11.8)
Identified Gender			
Male	18	12.5	
Female	125	86.8	
Missing	1.0	0.7	
Race			
American Indian or Alaska Native	1	0.07	
Black or African American	2	1.4	
White/European American	130	90.3	
Other	7	4.9	
Preferred Not to Disclose	3	2.1	
Ethnicity			
Hispanic or Latinx	11	7.6	
Not Hispanic	129	89.6	
Number of years in the field			
Less than one year	15	10.4	
1-5 years	30	20.8	
More than 5 years	98	68.1	

Pearson correlations found no significant associations between any of the demographic variables and the criterion variables. Specifically, age, identified gender, race/ethnicity, and number of years in the field were not related to PTSS or depressive symptoms ($p > 0.05$). Therefore, they were not included in subsequent analyses. Correlation matrices can be found in Table 3.

Table 3

Correlation Matrix

Variable		PCL Total	PHQ9 Total	Gender (Male)	Years in Field
PCL Total	Pearson Correlation	1	.502**	-.096	.024
	Sig. (2-tailed)		.000	.272	.785
	N	133	130	132	132
PHQ9 Total	Pearson Correlation	.600**	1	.087	.098
	Sig. (2-tailed)	.000		.327	.266
	N	130	131	130	130
Gender (Male)	Pearson Correlation	-.096	.087	1	.171*
	Sig. (2-tailed)	.272	.327		.042
	N	132	130	143	143
Years in the Field	Pearson Correlation	.024	.098	.171*	1
	Sig. (2-tailed)	.785	.266	.042	
	N	132	130	143	143

** denotes correlation is significant at the 0.01 level (2-tailed)
*denotes correlation is significant at the 0.05 level (2-tailed)

The primary outcome measures significantly deviated from a normal distribution (KS test $p > 0.05$; Table 4), and log transformations were attempted. Despite these transformations, data remained significantly deviant from a normal distribution. Therefore, parametric and nonparametric statistics were conducted when appropriate, to confirm findings.

Table 4

Tests of Normality

Variable	Kolmogorov-Sminov				Shapiro-Wilk		
	Statistic	Df	Sig.		Statistic	Df	Sig
PCL Total	.137	120	.000		.920	130	.000
PHQ9 Total	.110	130	.001		.939	130	.000

Outcomes data were depicted visually using plots (Figures 1 and 2). No outliers were identified. For PTSS, the Durbin-Watson statistics were 1.936 (H1), 1.817 (H2), and 1.813 (H3). For depressive symptoms, the Durbin-Watson statistics were 1.988 (H1), 1.781 (H2), and 2.064 (H3). All statistics indicated acceptable levels of autocorrelation.

Figure 1

Normal Q-Q Plot of PCL-5 Total
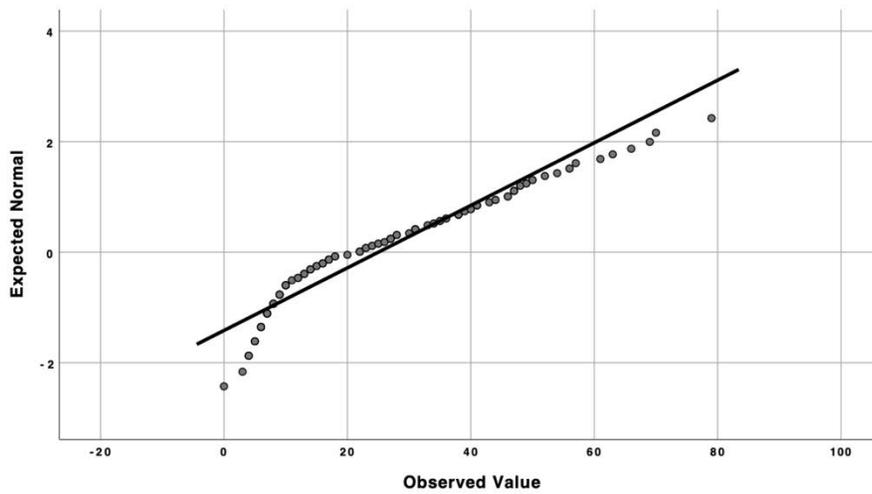
Figure 2

Normal Q-Q Plot of PHQ9 Total
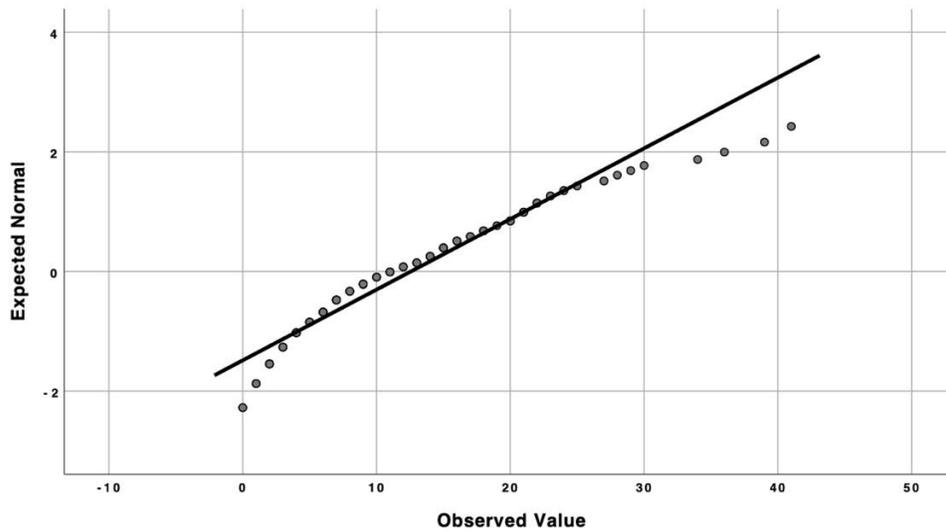
Posttraumatic Stress Symptoms

When reporting on PTSS, 93% of participants (*n* = 133) completed the PCL-5. The average score for PCL-5 was 25.02 with a standard deviation of 9.46. Scores ranged from .00 to 79.00 (Table 5). Results indicated 45.11% of operators met the cutoff score of ≥ 28, indicating PTSS.

Table 5

Descriptive Statistics for Posttraumatic Stress Symptoms (n = 133)

		Statistic
PCL Total	Mean	25.0231
	Std. Deviation	17.66725
	Minimum	.00
	Maximum	79.00

Depressive Symptoms

In total, 91.6% of participants (*n* = 131) completed the PHQ-9. The mean score on the

PHQ-9 was 11.72 with a standard deviation of 6.92, indicating a moderate depression level.

Descriptive statistics for the PHQ-9 are in Table 6, along with percentage of operators who met

varying levels of depressive symptoms according to PHQ-9 scoring.

Table 6

Descriptive Characteristics of Depressive Symptoms (n = 131)

		Statistic	Percentage
PHQ-9 Total	Mean	11.7252	
	Std. Deviation	6.92271	
	Minimum	.00	
	Maximum	27.00	
	Minimal Depression		21.37
	Mild Depression		30.53
	Moderate Depression		17.55
	Moderate Severe Depression		16.03
	Severe Depression		14.5

Hypothesis I

To evaluate whether higher levels of nontangible social supports predicted lower

psychological distress (as measured by the PCL-5 and the PHQ-9), regression analyses were

conducted using perceived social support (as measured by the SPS) as the predictor variable, and

PTSS and depression symptoms as criterion variables.

Posttraumatic Stress Symptoms

The results of the linear regression analysis revealed a correlation (R) of .393 with a coefficient of determination (R^2) of .154. This indicated that 15.4% of the variance in PTSS scores observed was attributed to perceived nontangible social support (Table 7). Table 8 presents the overall regression analysis. This revealed a significant regression ($F(1,128) = 23.153$, $p < 0.001$). Further analysis as shown in Table 9 demonstrates that social support (as measured by the SPS), made a significant contribution to the prediction of PTSS (as measured by the PCL-5). Nonparametric analysis via a Spearman correlation was explored to confirm a significant relationship between social provision scores and PTSS given the normality assumption violation ($r_s = .355$, $p < 0.001$).

Table 7

Model 1 Summary of the Predictor Variable (Nontangible Social Support) to the Criterion Variable (Posttraumatic Stress Symptoms)

Model	R	R^2	Adjusted R^2	Std. Error of Est.	R^2 Change	F Change	Df1	Df2	Sig. F Change
1	.393	.154	.148	16.49276	.154	25.153	1	127	.000*

*Denotes significance

Table 8

Overall Regression Analysis with Predictor Variable (Social Support) to the Criterion Variable (Posttraumatic Stress Symptoms)

Model	Sum of Squares	Df	Mean Square	F	Sig
1 Regression	6297.829	1	6297.829	23.153	.000*
Residual	34545.396	127	272.011		
Total	40843.225	128			

*Denotes significance

Table 9

Coefficient of Predictor Variable (Nontangible Social Support) to the Criterion Variable (Posttraumatic Stress Symptoms)

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	T	Sig.
1 (constant)	72.104	9.812		7.348	.000*
Nontangible Social Support	-.631	.131	-.393	-4.812	.000*

Depressive Symptoms

The results of the linear regression analysis revealed a correlation (R) of .465 with a coefficient of determination (R^2) of .216. This indicated that 21.6% of the variance in depressive symptoms was attributed to perceived nontangible social support (Table 10). Table 11 presents the overall regression analysis. This revealed significant regression ($F(1125)= 34.421, p = <$ 0.001). Further analysis as shown in Table 12 demonstrates that nontangible social support made a significant contribution to depressive symptoms (as measured by the PHQ-9). Nonparametric

analysis via a Spearman correlation was explored to confirm a significant relationship between social provision scores and depressive symptoms given the normality assumption violation (r_s = .434, $p < 0.001$).

Table 10

Model 1 Summary of the Predictor Variable (Nontangible Social Support) to the Criterion Variable (Depressive Symptoms)

Model	R	R^2	Adjusted R^2	Std. Error of Est.	R^2 Change	F Change	Df1	Df2	Sig. F Change
1	.465	.216	.210	6.12871	.216	34.421	1	125	.000*

*Denotes significance

Table 11

Overall Regression Analysis with Predictor Variable (Nontangible Social Support) to the Criterion Variable (Depressive Symptoms)

Model	Sum of Squares	Df	Mean Square	F	Sig
1 Regression	1292.907	1	1292.907	32.421	.000*
Residual	7185.883	125	37.561		
Total	8956.378	126			

*Denotes significance

Table 12

Coefficient of Predictor Variable (Nontangible Social Support) to the Criterion Variable (Depressive Symptoms)

	Unstandardized Coefficients			Standardized Coefficients		
Model	B	Std. Error		Beta	t	Sig.
1 (constant)	33.341	3.692			9.029	.000*
Nontangible Social Support	-.290	.049		-.465	-5.867	.000*

*Denotes significance

Hypothesis II

To identify whether greater use of emotion-focused disengagement predicted higher psychological distress (PTSS and depressive symptoms), regression analyses were conducted using emotion-focused disengagement coping style (as measured by the CSIF) as the predictor variable, and PTSS and depressive symptoms as criterion variables.

Posttraumatic Stress Symptoms

Linear regression analyses found a correlation (R) of .416 with a coefficient of determination (R^2) of .173. This indicated that 17.3% of the variance regarding PTSS observed could be attributed to having an emotion-focused disengagement coping style (Table 13). Table 14 presents the overall regression model, which was significant ($F(1,131)= 27.237, p < 0.001$). Further analysis shown in Table 15 demonstrates that emotion-focused disengagement (as measured by the CSIF) made a significant contribution to PTSS. Nonparametric analyses via Spearman correlation were utilized to confirm a significant relationship between PTSS and coping style ($r_s = .389, p < 0.001$).

Table 13

Model 1 Summary of the Predictor Variable (Emotion-Focused Disengagement Coping Style) to the Criterion Variable (Posttraumatic Stress Symptoms)

Model	R	R^2	Adjusted R^2	Std. Error of Est.	R^2 Change	F Change	Df1	Df2	Sig. F Change
1	.416	.173	.167	16.18188	.173	27.237	1	130	.000*

*Denotes significance

Table 14

Overall Regression Analysis with Predictor Variable (Emotion-Focused Disengagement Coping Style) to the Criterion Variable (Posttraumatic Stress Symptoms)

Model	Sum of Squares	Df	Mean Square	F	Sig
1 Regression	7131.970	1	7131.970	27.237	.000*
Residual	34040.909	130	261.853		
Total	41172.879	131			

*Denotes significance

Table 15

Coefficient of Predictor Variable (Emotion-Focused Disengagement Coping Style) to the Criterion Variable (Posttraumatic Stress Symptoms)

	Unstandardized Coefficients		Standardized Coefficients		
Model	B	Std. Error	Beta	t	Sig.
1 (constant)	-16.474	8.034		-2.051	.042
Emotion-Focused Disengagement Coping Style	3.632	.696	.416	5.219	.000*

*Denotes significance

Depressive Symptoms

Linear regression analysis revealed a correlation (R) of .462 with a coefficient of determination (R^2) of .213. This indicated that 21.3% of the variance in regard to depressive symptoms observed could be attribute to emotion-focused disengagement coping style (Table 16). Table 17 presents the overall regression analysis. This revealed significant regression ($F(1,128)= 34.704, p < 0.001$). Further analysis as depicted in Table 18 demonstrated that emotion-focused disengagement made a significant contribution to depressive symptoms in a negative direction. Nonparametric analysis via a Spearman correlation was explored to confirm a significant relationship between emotion-focused disengagement coping style scores and depressive symptoms given the normality assumption violation (r_s .462, $p < 0.001$).

Table 16

Model 1 Summary of the Predictor Variable (Emotion-Focused Disengagement Coping Style) to the Criterion Variable (Depressive Symptoms)

Model	R	R^2	Adjusted R^2	Std. Error of Est.	R^2 Change	F Change	Df1	Df2	Sig. F Change
1	.462	.213	.207	6.18538	.213	34.704	1	128	.000*

*Denotes significance

Table 17

Overall Regression Analysis with Predictor Variable (Emotion-Focused Disengagement Coping Style) to the Criterion Variable (Depressive Symptoms)

Model	Sum of Squares	Df	Mean Square	F	Sig
1 Regression	1327.753	1	1327.753	34.704	.000*
Residual	4897.139	128	38.259		
Total	6224.892	129			

*Denotes significance

Table 18

Coefficient of Predictor Variable (Emotion-Focused Disengagement Coping Style) to the Criterion Variable (Depressive Symptoms)

	Unstandardized Coefficients		Standardized Coefficients		
Model	B	Std. Error	Beta	t	Sig.
1 (constant)	-5.924	3.042		-1.947	.054
Emotion-Focused Disengagement Coping Style	1.555	.264	.462	5.891	.000*

*Denotes significance

Hypothesis III

To identify whether poor sleep predicted higher psychological distress (PTSS and depressive symptoms), regression analyses were conducted using sleep quality (as measured by the PSQI) as the predictor variable, and PTSS and depressive symptoms as criterion variables.

Posttraumatic Stress Symptoms

Linear regression analysis found a correlation ® of .484 with a coefficient of

determination (R^2) of .235. This indicated that 24% of the variance regarding PTSS observed

could be attributed to quality of sleep (Table 19). Table 20 presents the overall regression

analysis. This revealed significant regression ($F(1,119)$, $p < 0.001$). Further analysis as depicted

in Table 21 demonstrated that poor sleep quality (as measured by the PSQI) made a significant

contribution to PTSS, and in a negative direction. Nonparametric analysis via a Spearman

correlation was utilized to confirm a significant relationship between sleep quality scores and

PTSS given the normality assumption violation ($r_s = .468$, $p < 0.001$).

Table 19

Model 1 Summary of the Predictor Variable (Sleep Quality) to the Criterion Variable
(Posttraumatic Stress Symptoms)

Model	R	R^2	Adjusted R^2	Std. Error of Est.	R^2 Change	F Change	Df1	Df2	Sig. F Change
1	.484	.235	.228	15.89316	.235	36.153	1	118	.000*

*Denotes significance

Table 20

Overall Regression Analysis with Predictor Variable (Sleep Quality) to the Criterion Variable (Posttraumatic Stress Symptoms)

Model	Sum of Squares	Df	Mean Square	F	Sig
1 Regression	9132.044	1	9132.044	36.153	.000*
Residual	29805.922	118	252.593		
Total	38937.967	119			

*Denotes significance

Table 21

Coefficient of Predictor Variable (Sleep Quality) to the Criterion Variable (Posttraumatic Stress Symptoms)

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
1 (constant)	-3.310	4.877		-.679	.499
Sleep Quality	1.812	.301	.484	6.013	.000

Depressive Symptoms

The results of the linear regression analysis revealed a correlation (R) of .556 with a coefficient of determination (R^2) of .309. This indicated that 30.9% of the variance in regard to depressive symptoms observes could be attributed to sleep quality (Table 22). Table 23 presents the overall regression analysis. This revealed a significant regression ($F(1,115) = 51.525, p < 0.001$). Further analysis as illustrated in Table 24 demonstrated that sleep quality made a significant contribution to depressive symptoms, and in a negative direction. Nonparametric

analysis via a Spearman correlation was conducted to confirm a significant relationship between

sleep quality scores and depressive symptoms given the normality assumption violation (r_s =

.566, $p < 0.01$).

Table 22

Model 1 Summary of the Predictor Variable (Sleep Quality) to the Criterion Variable (Depressive Symptoms)

Model	R	R^2	Adjusted R^2	Std. Error of Est.	R^2 Change	F Change	Df1	Df2	Sig. F Change
1	.556	.309	.303	5.97595	.309	51.525	1	115	.000*

*Denotes significance

Table 23

Overall Regression Analysis with Predictor Variable (Sleep Quality) to the Criterion Variable (Depressive Symptoms)

Model	Sum of Squares	Df	Mean Square	F	Sig
1 Regression	1840.051	1	1840.051	51.525	.000*
Residual	4106.972	115	35.712		
Total	5946.923	116			

*Denotes significance

Table 24

Coefficient of Predictor Variable (Sleep Quality) to the Criterion Variable (Depressive Symptoms)

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
1 (constant)	-1.037	1.857		-.558	.578
Sleep Quality	.827	.115	.556	7.178	.000 *

*Denotes significance

Multiple Regression Models Including All Significant Predictors

Posttraumatic Stress Symptoms

All significant predictors found to individually relate to PTSS were entered into a linear regression. Analyses revealed a multiple correlation, $R = .617$, with a coefficient of determination (R^2) of .381. This indicated that 38.1% of the variance regarding PTSS observed in this sample could be attributed to perceived nontangible social support, emotion-focused disengagement coping style, and poor sleep quality. Table 25 presents the results of the multiple linear regression analysis. Table 26 presents the overall regression analysis. This revealed a significant regression ($F(3,115)= 22.960, p < 0.001$). This suggests that the combination of nontangible social support, emotion-focused disengagement coping style, and poor sleep quality made a significant contribution to the prediction of PTSS.

As displayed in Table 27, the beta weight and statistical significance were analyzed and examined. This examination of each predictor variable revealed that nontangible social support ($p < 0.001$) was negatively correlated with PTSS. It also showed that emotion-focused

disengagement coping style ($p = .006$) and poor sleep quality ($p < 0.001$) were predictive of

PTSS.

Table 25

Model 1 Summary of the Predictor Variables (Nontangible Social Support, Emotion-Focused Disengagement, and Sleep Quality) to the Criterion Variable (Posttraumatic Stress Symptoms)

Model	R	R^2	Adjusted R^2	Std. Error of Est.	R^2 Change	F Change	Df1	Df2	Sig. F Change
1	.617	.381	.364	14.43219	.381	22.960	3	112	.000*

*Denotes significance

Table 26

Overall Regression Analysis with Predictor Variables (Nontangible Social Support, Emotion-Focused Disengagement Coping Style, and Sleep Quality) to the Criterion Variable (Posttraumatic Stress Symptoms)

Model	Sum of Squares	Df	Mean Square	F	Sig
1 Regression	14346.870	3	4782.290	22.960	.000*
Residual	23328.268	113	208.288		
Total	37675.138	115			

*Denotes significance

Table 27

Coefficient of Predictor Variables (Nontangible Social Support, Emotion-Focused Disengagement Coping Style, and Poor Sleep Quality) to the Criterion Variable (Posttraumatic Stress Symptoms)

	Unstandardized Coefficients		Standardized Coefficients		
Model 1 (constant)	B	Std. Error	Beta	T	Sig.
	8.816	15.184		.581	.563
Nontangible Social Support	-.417	.127	-.260	-3.277	.001
Emotion-Focused Disengagement Coping Style	2.065	.732	.224	2.823	.006
Sleep Quality	1.486	.293	.389	5.073	.000

Depressive Symptoms

All significant predictors found to individually relate to depression were then entered into a linear regression. The results revealed a multiple correlation, $R = .716$, with a coefficient of determination (R^2) of .512. This indicated that 51.2% of the variance regarding depressive symptoms observed in this sample could be attributed to perceived nontangible social support, emotion-focused disengagement coping style, and poor sleep quality. Table 28 presents the results of the regression analysis. Table 29 presents the overall regression analysis. This revealed a significant regression ($F(3,109)= 38.176, p < 0.001$). This suggests that the combination of nontangible social support, emotion-focused disengagement coping style, and poor sleep quality made a significant contribution to the prediction of depressive symptoms.

As displayed in Table 30, the beta weight and statistical significance were analyzed and examined. This examination of each predictor variable revealed that nontangible social support ($p < 0.001$) was negatively correlated with depressive symptoms. It also showed that emotion-focused disengagement coping style and poor sleep quality were predictive of depressive symptoms ($p < 0.001$).

Table 28

Model 1 Summary of the Predictor Variables (Nontangible Social Support, Emotion-Focused Disengagement, and Sleep Quality) to the Criterion Variable (Depressive Symptoms)

Model	R	R^2	Adjusted R^2	Std. Error of Est.	R^2 Change	F Change	Df1	Df2	Sig. F Change
1	.716	.512	.499	5.05239	.512	38.176	3	109	.000*

*Denotes significance

Table 29

Overall Regression Analysis with Predictor Variables (Nontangible Social Support, Emotion-Focused Disengagement Coping Style, and Sleep Quality) to the Criterion Variable (Depressive Symptoms)

Model	Sum of Squares	Df	Mean Square	F	Sig
1 Regression	2923.521	3	974.507	38.176	.000*
Residual	2782.408	109	25.527		
Total	5705.929	112			

*Denotes significance

Table 30

Coefficient of Predictor Variables (Nontangible Social Support, Emotion-Focused Disengagement Coping Style, and Sleep Quality) to the Criterion Variable (Depressive Symptoms)

	Unstandardized Coefficients		Standardized Coefficients		
Model 1 (constant)	B	Std. Error	Beta	t	Sig.
	3.434	5.356		.641	.523
Nontangible Social Support	-.186	.045	-.294	-4.110	.000*
Emotion-Focused Disengagement Coping Style	1.040	.258	.289	4.035	.000*
Sleep Quality	.654	.105	.432	6.254	.000*

*Denotes significance

CHAPTER 5: DISCUSSION

The aim of this study was to assess the relationship between several risk and protective factors (sleep quality, social support, sleep) and depressive and PTSD symptoms in 911 operators and dispatchers. The findings from this study support some existing literature on specific risk and protective factors relating to psychosocial functioning. They also provided more information to advance the knowledge and understanding of how such factors impact 911 operators—an under-researched population. Additionally, results raised further questions for future researchers to examine and expand upon.

As hypothesized, higher levels of nontangible social supports predicted lower PTSS and depression symptomology. Specifically, this study's findings corroborate Kondrat and colleagues' (2018) proposition that social support is uniquely intertwined with mental health, as operators who reported lower PTSS scores indicated greater use of social support. This finding also corroborates previous research that concluded significant relationships between perceived social support and psychosocial functioning (Guay et al., 2006; Schnurr et al., 2004). Moreover, this finding supports research on 911 operators who provided emergency services during a natural disaster while simultaneously experiencing this trauma for themselves (Jenkins, 1997). Jenkins (1997) found whether an operator used their social supports predicted levels of distress. Specifically, findings indicated that operators who used social support during this time reported lower PTSS, specifically intrusive symptoms (Jenkins, 1997). This is important to consider for this population, as intrusive symptoms have been found to maintain poor psychosocial functioning (Åkerstedt et al., 2002; Lepore, 2001). Although Jenkins's sample differs from the current study in that the operators were experiencing the traumatic incident in their personal lives as well and, therefore, had another layer of trauma exposure, it helps to understand the

importance of social support for those chronically exposed to trauma. In considering the ecological systems theory, it could be argued that operators who are unable to manage the psychosocial effects of chronic trauma exposure at work could ultimately see its effects in their personal lives. Yet, similar results were found in emergency medical dispatchers who received social support: receiving social support predicted better psychological well-being than not receiving support, specifically as it related to decreased levels of PTSD (Shakespeare-Finch et al., 2015). Although that particular study was conducted in Australia and could have different cultural components than the United States, social support was assessed similarly with a focus on emotional and instrumental support. Therefore, understanding and considering the benefits of social supports for operators is helpful for improving their psychosocial functioning as demonstrated in past and current literature.

This study's findings also support Joseph et al.'s (1997) and Lepore's (2001) etiological models that postulate the contributive nature of social support regarding psychosocial functioning. Joseph et al. proposed receiving others' points of view can negatively or positively influence the way individuals interpret traumatic events. Lepore's (2001) model adds that the nature and quality of social supports impacts whether an individual avoids disclosing or thinking about trauma-related events. Nontangible supports are types of help received that are not physically assisting an individual. Instead, nontangible supports provide guidance, reassurance of worth, a sense of attachment, and other assistance (e.g., advice, emotional closeness that provides a sense of security, and a sense of belonging; Cutrona & Russell, 1987). Cutrona and Russell (1987) suggested that cognitive processes mediate social support, as cognitive processes can enhance an individual's self-efficacy. This is important to note as it has previously been reviewed that an individual's self-efficacy beliefs not only establish how he or she feels, thinks,

and behaves but also impacts how he or she sees the self, world, and challenges (Bandura, 1994).

Therefore, receiving these types of nontangible social support posited in both models is

important to the cognitive, behavioral, and emotional processes related to PTSS (Guay et al.,

2006). The cognitive restructuring that may take place in these social interactions has been

suggested to help in the recovery and decrease of PTSS over time (Gutner et al., 2006). In

considering the importance of cognitive restructuring needed to integrate trauma, findings of the

current study support the importance of nontangible support as a protective factor against trauma

symptoms, which leads to healthier psychosocial functioning.

Additionally, as hypothesized, this study found a significant negative relationship

between nontangible social support and depressive symptoms, which is similar to previous

findings in the general population (Cutrona & Russell, 1987; Henderson, 1992; Semmer et al.,

2008). This current finding also supports previous research that indicated receiving nontangible

social support, such as empathy and acceptance from others through expressing their emotions,

helps individuals feel cared for (Brewin et al., 2000; Guay et al., 2006; Gutner et al., 2006;

Schnurr et al., 2004).

Horneffer and Fincham (1995) found depressed individuals perceive their social supports

as having negative intentions. Guay et al. (2006) furthered this position by stating this distorted

perception leads depressed individuals to underevaluate their social support in addition to the

negative perception of support available. This seems logical when considering the most accepted

conceptualization of depression is A. T. Beck's model, which states the combination of having

strong negative views of self and others leads to high expectations for negative outcomes and

low expectations for positive outcomes (A. T. Beck & Bredemeier, 2016). Such tendencies to

negatively process information and experience biological reaction to stress leads to negative,

depressive beliefs about the self, world, and future (A. T. Beck & Bredemeier, 2016). The

current study advances these findings by not only supporting the existing relationship between

depression and perceived social support, but by gaining a better understanding of how engaging

in nontangible social support is a protective factor against the development and maintenance of

depressive symptoms.

This study supports the existence of comorbidity with PTSS and depression (Flory &

Yehuda, 2015; Rojas et al., 2014), as they were found to be correlated heavily with each other

within the sample. In a meta-analysis, Rytwinski et al. (2013) found 52% of participants across

57 studies with over 6,000 participants who experienced PTSD symptoms as a result of a variety

of traumatic events were also experiencing depressive symptoms. Similar comorbidity

presentation has been documented for first responders. Specifically, PTSD and depression were

found to be present in police officers (Centers for Disease Control and Prevention, 2006); and

firefighters (Fullerton et al., 2004).

This indicated a potential diagnostic overlap between PTSS and depressive symptoms,

which may suggest that depression may be better be conceptualized as a stressor-related

presentation secondary to trauma (Flory & Yehuda, 2015). These current findings support the

underlying mechanism that may help to understand the relationship between PTSS and

depression: the perception of having nontangible social support. Nontangible support

significantly related to both PTSS and depression. Specifically, those who reported having

higher nontangible social support demonstrated healthier psychosocial functioning as

demonstrated by reporting lower PTSS and depressive symptoms.

Researchers have determined a relationship between coping style and psychosocial

functioning (Poudel-Tandukar et al., 2020; Schnider et al., 2007; Yan & Wang, 2005).

Specifically, researchers have found avoidant coping style to be highly associated with poor

overall mental health outcomes (Coyne & Racioppo, 2000; Littleton et al., 2007). Further

studies demonstrated PTSD severity scores correlated with avoidant emotional coping style

(Schnider et al., 2007). This current study found a relationship between coping style and

psychosocial functioning, though the directionality of this relationship did not occur as

hypothesized. Findings indicate greater use of emotional disengagement, characterized by a

coping style that discounts the relevance or meaningfulness of stressful experiences and avoids

emotional reactions, predicted lower PTSS and depressive symptoms in 911 operators and

dispatchers, and thus serves as a protective factor.

In general, this supports research indicating a relationship exists between coping style

and psychosocial functioning (Folkman & Moskowitz, 2004; Littleton et al., 2007; Masel et al.,

1996); however, this contradicts literature on how avoidance-type behaviors, such as emotional

disengagement coping style, impacts psychosocial functioning specifically as it relates to

exposure to traumatic events (Grant et al., 2013; Hassija et al., 2012; Lilly & Graham-Bermann,

2010; Littleton et al., 2007; Ullman et al., 2007). This study's findings may differ for several

reasons. First, the sample size was smaller in comparison to previous studies. Second, these

studies differed in type of trauma experienced in their population samples such as survivors of

direct physical or sexual violence (Lilly & Graham-Bermann, 2010; Ullman et al., 2007) or

veterans receiving general mental health treatment or specialized treatment to address their

PTSD (Hassija et al., 2012).

The current study directly opposes Grant et al.'s (2013) findings that indicated depressive

symptoms were not related to cognitive avoidance coping; results could differ for a few reasons.

First, Grant et al.'s study was conducted with college students whose exposure to trauma may

differ vastly from operators' chronic exposure. Second, they used different measures to assess

coping and depression and were able to assess at two different points to allow for changes in

symptoms to be obeserved. Furthermore, in the meta-analysis conducted by Littleton and

colleagues (2007), the reliance on avoidance coping was found to be maladaptive for

psychosocial functioning; however, the studies reviewed had participants who experienced

interpersonal violence or severe injuries as their traumatic events. This may be seen as

categorically different from what operators are exposed to.

The current study supports Anshel et al. (2013), who found greater use of avoidance

coping strategies in a similar sample of emergency dispatchers predicted lower perceived stress

levels. Avoidance coping strategies were conceptually the same as the emotion-focused

disengagement strategies assessed in the current study. Additionally, Allen et al. (2016) found

emotion-focused disengagement style was a protective factor for the immediate moment, which

this study supports. In contrast, Allen et al. (2016) posited that this coping style could have

negative long-term psychosocial impacts. The current study was not longitudinal in nature and,

therefore, unable to assess for long-term impact of utilizing this coping style, which may also

contribute to these conflicting findings.

Researchers have emphasized the importance of the "fit" between the stressor and coping

strategies utilized (Folkman & Moskowitz, 2004; Masel et al., 1996). This may contribute to the

outcome discrepancies, given the differences in stressors experienced across studies. In addition,

previous studies differed in how coping style was measured and methodology used, as other

studies included a variation of clinical interviews as part of their assessment procedures.

Although this study's findings did not support the hypothesis that conceptualized

emotion-focused disengagement style as a risk factor for developing PTSS, the results provide

insight into how this style of coping may impact operators. That is, this study's findings could

support Allen and colleagues (2016), who postulated that emotion-focused disengagement

coping strategies may be more effective in the immediate aftermath of hearing traumatic events

in order continue their work responsibilities. Therefore, it may serve as a protective factor for

operators given their work atmosphere (i.e., fast-paced nature, chronic exposure to traumatic

events, back-to-back emergency calls, etc.); however, such avoidant coping strategies may be

problematic and serve as a risk factor for poor long-term psychosocial functioning (Allen et al.,

2016), even more so if individuals persist on relying on these strategies (Snyder & Pulvers,

2001). Given the conflicting findings within current literature, future studies should further

evaluate the relationship between emotion-focused disengagement coping and mental health in

this population.

Lastly, poorer sleep quality was hypothesized to predict higher levels of PTSS and

depression. The current study found a significant positive relationship between sleep quality and

psychosocial functioning, supporting this hypothesis. It also furthers supports past research that

has indicated a relationship between sleep quality and psychosocial functioning (Adams et al.,

2015; Dicks, 2014). Moreover, sleep was found to be the strongest predictor in this study, as it

accounted for 38.9% and 43.2% of the variance within PTSS and depression scores, respectively.

Given the strong predictive relationship, sleep is an important factor when considering healthy

psychosocial functioning within operators. Specifically, scores indicating poor sleep quality

predicted higher PTSS scores within operators. This finding confirms literature regarding the

presence of PTSS in individuals who have poor sleep quality due to daily work stressors inherent

in this type of work (Dicks, 2014). These findings support Åkerstedt et al.'s (2002) proposal that

PTSS, such as the inability to free oneself of intrusive thoughts related to trauma experienced at work, is a contributing factor between sleep disturbances and stress.

This study's findings advance the current literature by identifying a relationship between poor sleep quality and depression for operators. That is, poor sleep quality was identified as a risk factor for the presence of depression. Past literature has focused primarily on the cyclical relationship between work stressors and poor sleep quality (Åkerstedt, 2003) and how this impairs necessary cognitive and behavioral functioning vital to effectively work as an operator (Ellenbogen, 2005). Sleep issues have also been explored because they relate specifically to greater mental health concerns such as symptoms of PTSD (Åkerstedt et al., 2002; Dicks, 2014). This current study bridges the gap in the literature by providing more information on how this cyclical relationship may contribute to depressive symptoms and its presence within this specific population. Furthermore, this study's findings suggest there is a link between work stressors that lead to sleep disturbances that then impact psychosocial functioning. It is important to note that sleep disturbances are a symptom of depression (APA, 2013), so there is also a possibility that depression begets sleep quality issues.

Clinical Implications

The current findings provide greater understanding of the relationship between several risk and protective factors as they relate to the severity of PTSS and depressive symptoms in a population exposed chronically to trauma. Nearly 400,000 first responders in the U.S., and 10% of all on-scene first responders worldwide, experience PTSS with associated impairments in daily functioning (Berger et al., 2012; Haugen et al., 2012). Several studies have established the presence of PTSS in on-scene first responders. Studies indicated 7% to 19% of police officers (Carlier et al., 1997; Gersons, 1989; Maia et al., 2007; Martin et al., 2009; Robinson et al., 1997)

and 17% to 22% of firefighters (Sattler et al., 2013; Vieweg et al., 2006; Wagner et al., 1998) experience PTSS. Additionally, 8.5% of volunteer firefighters exposed to a bush fire met criteria for depression (McFarlane & Papay, 1992); and 21.7% of disaster workers exposed to an active plane crash site demonstrated depression 13 months post trauma incident (Fullerton et al., 2004). The current study suggests that listening to traumatic events unfold while attempting to provide immediate help can lead to similar negative outcomes affecting psychosocial functioning to those of on-scene first responders' experiences.

Dicks (2014) reported that 30.8% of operators within her sample experienced PTSD as indicated by meeting the cutoff total symptom severity score of 28 or greater. Dicks noted that through personal communication with Dr. Michelle Lilly (2014), she received the corrected prevalence rate of PTSD in their study with operators (Pierce and Lilly, 2012). It was found that 9.7% of their operator sample met same cutoff score indicating PTSD (Lilly, 2014). This current study found 45.11% of operators met the same symptom severity cutoff score used in previous studies, indicating they experienced significant PTSS. It is important to note that due to a lack of clinical interviews needed to appropriately diagnose PTSD, only the presence of these symptoms is noted within this study. When considering 3.4% of the general population (APA, 2013) and 5% to 32% of first responders (Klimley et al., 2018) experience PTSD, the current study's finding sheds light on the tremendous psychosocial impact that listening to traumatic events occur while simultaneously providing a quick and efficient emergency response can have on operators. This study also provides information on some risk and protective factors that influence the development or maintenance of these symptoms.

Furthermore, APA (2013) reported about 7% of the general population in the United States experiences depression. Conversely, Jones et al. (2018) provided a wide prevalence range

of 7% to 22% within first responders, excluding operators, who experience depression. The

current study sheds a much-needed light on first responders, by providing data on operators who

experience varying levels of depressive symptoms. Based on operators' responses in the current

study, the following depressive symptom severity levels were indicated: 21.37%, minimal

depression; 30.53%, mild depression; 17.55%, moderate depression; 16.03%, moderate severe

depression; and 14.5%, severe depression. This finding suggests operators are at risk of

developing depression given their work experiences. This study was able to identify some risk

and protective factors that contribute to this presentation. Again, it is important to note this study

did not provide diagnoses, but rather collected information on operators' experiences with

depressive symptoms given the nature of their work.

Overall, this study's findings support the small body of literature that proposes operators

are first responders whose psychosocial functioning can be impaired given their auditory

exposure to trauma and stress at work through the telephone, despite not physically being present

on the scene (Anshel et al., 2013; Dicks, 2014; Pierce & Lilly, 2012; Shakespeare-Finch et al.,

2015; Troxell, 2008). The current study indicates the presence of PTSS and depressive

symptoms within 911 operators and, as such, has many implications.

These findings can be applied to the development of specific screening and assessment

for 911 operators as prevention and intervention strategies. First, given the high rates of PTSS

and depression, regular screening for these conditions in operators may be warranted.

Additionally, these findings can be applied to the development of specific cognitive-behavioral

therapy (CBT) interventions for this population. Such implications can help promote better care

for operators, which could benefit their quality of life both personally and occupationally.

Further, better screening for PTSS and depression, as well as tailored CBT treatments, could

improve effectiveness at work which ultimately benefits the public and the department, as it can help reduce turnover rates.

Social Support

By identifying nontangible social support as a protective factor for better overall psychosocial functioning, operators and those in their lives can engage in these behaviors as a way to support and provide needed care found to be helpful for overall functioning. This is an important finding, as operators have been noted to avoid sharing their work stress with others to protect those around them because it is embedded with traumatic content. This isolation in managing these stressors alone and not receiving nontangible social support can contribute to experiencing depression. Findings of this current study indicate that engaging in the opposite behavior, such as seeking and receiving support or feedback, can serve as a protective factor to help improve and maintain healthy psychosocial functioning. By using this type of support, operators could effectively manage trauma and depressive symptoms that may otherwise be exacerbated by repeated work exposure to trauma. In part, this form of support is effective because cognitive restructuring takes place when talking to supports (L. Davis & Brekke, 2014). Moreover, by gaining a healthy, more positive reappraisal of events, one's role functioning is strengthened (Kondrat et al., 2018); as such, operators receive support necessary to feel reenergized to continue working in this role.

With this knowledge, operators may begin to feel mastery over knowing with what type of support it is beneficial to engage. In doing so, their overall self-efficacy may be enhanced, and they may be better equipped to function on a daily basis to provide efficient help to those in need. It can be argued that operators' overall self-efficacy is improved then by gaining such mastery in managing symptoms related to work exposure to trauma and stress. In receiving this

type of support, operators begin to feel cared for and accepted, which directly opposes depressive symptoms such as the isolation or self-criticalness that they may experience.

By understanding that engagement in nontangible social support is a protective factor to combat negative psychosocial outcomes from the inherent trauma and stress of their work, operators may start to engage in this type of support within their microsystem from their peers, loved ones, or even psychological professionals in therapy. Consequently, those operators provide an example within their microsystem for peers to engage in similar behaviors to achieve healthier psychosocial functioning. Thus, operators can improve their ability to balance work and life stressors, making it more likely they can effectively manage stressors and remain in this line of work.

On a systemic level, this study's findings can provide specific tools employers can suggest to their employees and may encourage employers to better assess the support operators receive, thereby improving psychosocial functioning of their operators and, in turn, the service provided to civilians. Perhaps implementing their own support groups within the workplace or hiring therapeutic support to offer a space for operators to receive such nontangible support whenever needed can help those who may not enlist the help of those in their lives, or who may not have anyone in their lives who can offer this type of support.

Coping Style

Evidence from the data collected demonstrated a relationship between coping style and psychosocial functioning. The current study's findings indicate that operators who engage in emotion-focused disengagement style scored lower on the PTSS and depression measures. Although emotion-focused disengagement style has previously been noted as maladaptive (Littleton et al., 2007), these findings suggest it may actually serve as a protective factor for

operators' psychosocial functioning. Researchers have stated emotion-focused coping strategies promote and maintain avoidance associated with insufficient trauma processing seen in PTSS (Ehlers & Clark, 2000; Littleton et al., 2007). This may help in understanding the relationship between emotion-focused disengagement coping style and PTSS within this sample of operators, as those who reported lower PTSS scores also indicated engaging in more avoidant strategies and, therefore, did not experience PTSS. This provides a different view on the relationship between avoidant coping style and psychosocial functioning, as it was found to be a protective factor.

Notably, this finding could be due to benefits of avoiding negative internalization that occurs after stressful situations, particularly those that occur if operators perceive outcomes of traumatic emergency calls as failures and internalize them as their own failures (Yan & Wang, 2005). If they do so, this negative, personal perception may impact their self-efficacy, their mood, and how they interact within their systems, which will ultimately impact their psychosocial functioning. Therefore, in regard to the development of PTSS and depression, operators may benefit from using emotion-focused disengagement during situations in which emergency calls do not lead to positive outcomes and in which the alternative would be to view outcomes as personal failures, when they are not.

Given the fast-paced nature of the job and the tremendous number of traumatic incidents operators witness during their shifts, these findings suggest it may be more helpful for operators to actively disengage from their emotions throughout the day to help their psychosocial functioning. This supports the idea that operators should put personal reactions aside in order to fulfill their duties (Allen et al., 2016). It is important that operators remain calm and suppress their emotions during emergency calls in order to assess the situation and provide effective help

(Pierce & Lilly, 2012). By avoiding or discounting the meaningfulness of stressful input from emergency calls in the moment, they may be better able to remain focused on their specific job responsibilities to provide efficient responses.

Since this study's findings indicate engaging in emotion-focused disengagement may serve as a protective factor against the development of PTSS and depressive symptoms, there are different strategies operators can use to modify their coping styles to improve their psychosocial functioning. CBT-based strategies could be helpful in disengaging from problematic thoughts and feelings as a result from emergency calls such as stop, think, and act; guided imagery (e.g., visualizing a stop sign when beginning to focus on their own emotions or experiences during phone calls); and grounding techniques to help remain focused in the present moment.

Alternatively, other strategies that could be helpful when considering the possible long-term negative psychosocial impact could be the use of CBT strategies such as identifying distorted thoughts such as personalizing negative outcomes or labeling (e.g., "I'm a failure"), cognitive restructuring, journaling, mindfulness, or progressive muscle relaxation. These could be helpful if practiced regularly. Further strategies that may improve possible long-term psychosocial impact include the implementation of acceptance and commitment therapeutic (ACT) strategies in which operators notice, accept, and embrace their thoughts and emotions as they occur.

Sleep Quality

Evidence from this study indicated the importance of sleep for overall functioning, as sleep quality was found to significantly impact operators' psychosocial functioning. This study distinguishes sleep quality as an important contributing factor to PTSS and depressive symptoms. This distinction indicates the important differences between quantity and quality of

sleep. Although operators may have sufficient time in between shifts to sleep for the suggested number of hours, undisturbed quality sleep may not occur. This quality uninterrupted sleep is what operators require in order to restore functioning necessary to execute skills and responsibilities needed to provide effective service to those in emergencies (Ellenbogen, 2005; Noronha Liberalesso et al., 2012). Therefore, specific findings regarding the impact sleep has on operators' psychosocial functioning and their work effectiveness deems this a public concern.

Furthermore, these findings indicate a need for better assessments and protocols for operators returning to work in order to ensure they were able to receive quality sleep needed to restore functioning between shifts. This calls into question the harmful nature of mandatory overtime as a result of staff shortage. Although operators may extrinsically be motivated to work overtime in order to gain more money due to their low wages, the amount of time working may impede their ability to get vital restorative sleep before their next scheduled shifts. When considering their overall psychosocial functioning, it is important to note time outside of work should also be used for their leisure and personal responsibilities.

Furthermore, understanding the importance of sleep quality to improve operators' overall functioning at work can help systemically, wherein employers emphasize and advocate for good sleep quality between shifts. This concern for temployees may help improve turnover rates for these positions, as it can help enforce a healthy work-life balance. This concern for employees' psychosocial functioning could be demonstrated by providing education on sleep hygiene, assessing for sleep quality regularly as part of their protocol when reporting for work, and improving their own expectations and policies regarding overtime hours. The assessment of operators' sleep quality is important because the quantity of sleep does not directly provide information on how much restorative sleep operators are able to have.

This study provides evidence for the importance of sleep quality for healthier psychosocial functioning in operators. The emphasis on the positive outcomes of good sleep quality in operators includes better cognitive and behavioral performances that, in turn, may help retain employees. There have been several evidence-based interventions found to effectively treat disturbed sleep such as CBT for insomnia (CBT-I); imagery rehearsal therapy (IRT); and exposure, rescripting, and relaxation therapy (ERRT; Morin et al., 2006). Other behavioral interventions such as sleep hygiene, stimulus control, relaxation training, and mindfulness also have been found to improve sleep (Murawski et al., 2018).

 Employers are urged to use this data as evidence for a need to check in with operators regularly with the goal of providing support and care when and where needed, thus creating an atmosphere where operators feel safe and are more inclined to disclose difficulty in psychosocial areas that may interfere with their level of functioning at work. As a result of this, the public will benefit, as healthy, functioning operators can provide them with the best, most efficient response needed in emergency situations.

Strengths and Limitations

This study has several strengths. First, it utilized well-validated measures to assess for psychopathology that are frequently utilized in clinical settings, as well as for social support, coping style, and sleep quality. Additionally, recruiting online allowed for a more nationally representative sample.

This study had several limitations. First, some participants did not complete all of the questionnaires. Given that the study was conducted online and participants were recruited from support groups, this sample may not represent the greater operator population, particularly those not seeking support. Demographic questions did not require participants to disclose whether

they were operators or dispatchers, which could have been helpful to elicit differences between the two positions. Additionally, this study was correlational and observational by design, so no control group was available for comparison and participants were not tracked longitudinally to determine changes in functioning over time in the field. Further, the study did not control for previous traumas unrelated to work exposures that may have contributed to some of the scores related to trauma symptoms. The study also did not assess for preexisting mental health diagnoses, which could have impacted outcome scores. Additionally, this study was unable to control PTSS and depressive symptoms related to current non-work traumatic or stressful events. Lastly, all measures of psychopathology were self-reported and were not verified by clinical interviews.

Future Directions

Future studies may benefit from evaluating other risk and protective factors that were not addressed in this study. For instance, operators may not have an accurate mental representation of what the events look like because they are not physically on-scene. Not having an image of the actual events may impact operators. For example, their imaginations could catastrophize images they may replay throughout their days, which may impact their psychosocial functioning. Additionally, viewing oneself as a "helper" may be an important factor to consider when assessing for psychosocial functioning and conceptualizing as such. Although operators are not providing physical help to callers, operators are responsible for ensuring correct departments (e.g., police, firefighters) are dispatched to the correct location. Yet, it could be possible that physically helping callers may differentiate how much this "helper role" serves as a risk or protective factor for operators' psychosocial functioning. Alternatively, future studies could

explore alternative risk and protective factors by eliciting this information from operators by conducting more qualitative research.

Additionally, future studies could evaluate different geographical locations because different crime rates can impact the presence of PTSS in this population. Future studies could obtain participants' PTSS and depressive symptoms at the onset of employment to create a baseline and conduct longitudinal studies. By doing so, researchers can have a more reliable form of measuring the presence of PTSS and depressive symptoms that are related directly to work experience. Future researchers may want to consider assessing for vicarious trauma, as this can lead to different implications given the nature of the job.

Lastly, more research should be done regarding other systems within the work environment and factors that contribute to their functioning at work, such as perceptions that police officers have regarding how helpful operators are, amount of inclusion and respect offered to operators, and physical space (lights, temperature of room, sedentary desks, etc.).

Conclusion

In conclusion, this study's findings suggest that 911 operators are impacted by the chronic exposure to traumatic events in addition to their work stressors, as evidenced by the reported PTSS and depressive symptoms within this sample. The results indicated several specific risk and protective factors that may impact the development of PTSS and depression while working as a 911 operator (e.g., social support, coping style, and sleep quality). Further research is needed to better understand and support this under-researched population who provide essential services vital to the safety of our society.

REFERENCES

Adam, E. K., Hawkley, L. C., Kudielka, B. M., & Cacioppo, J. T. (2006). Day-to-day dynamics of experience–cortisol associations in a population-based sample of older adults. *Proceedings of the National Academy of Sciences of the United States of America*, *103*(45), 17058-17063. https://doi.org/10.1073/pnas.0605053103

Adam, E. K., Quinn, M. E., Tavernier, R., McQuillan, M. T., Dahlke, K. A., & Gilbert, K. A. (2017). Diurnal cortisol slopes and mental and physical health outcomes: A systematic review and meta-analysis. *Psychoneuroendocrinology*, *83*, 25-41. https://doi.org/10.1016/j.psyneuen.2017.05.018

Adams, K., Shakespeare-Finch, J., & Armstrong, D. (2015). An interpretative phenomenological analysis of stress and well-being in emergency medical dispatchers. *Journal of Loss and Trauma*, *20*(5), 430-448. https://doi.org/10.1080/15325024.2014.94914

Addison, C. C., Campbell-Jenkins, B. W., Sarpong, D. F., Kibler, J., Singh, M., Dubbert, P., Wilson, G., Payne, T., & Taylor, H. (2007). Psychometric evaluation of a coping strategies inventory short-form (CSI-SF) in the jackson heart study cohort. *International Journal of Environmental Research and Public Health*, *4*(4), 289-295. https://doi.org.ezproxy.pcom.edu/10.3390/ijerph200704040004

Åkerstedt, T. (2003). Shift work and disturbed sleep/wakefulness. *Occupational Medicine*, *53*(2), 89-94. https://doi.org/10.1093/occmed/kqg046

Åkerstedt, T., Knutsson, A., Westerholm, P., Theorell, T., Alfredsson, L., & Kecklund, G. (2002). Sleep disturbances, work stress and work hours: A cross-sectional study. *Journal of Psychosomatic Research*, *53*(3), 741-748. https://doi.org/10.1016/S0022-3999(02)00333-1

Allen, C. E., Mercer, M. C., & Lilly, M. M. (2016). Duty-related posttraumatic stress symptoms

in 911 telecommunicators: The roles of childhood trauma exposure and emotion-focused

coping. *Journal of Aggression, Maltreatment & Trauma*, *25*(7), 686-701.

https://doi.org/10.1080/10926771.2016.1175534

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders*

(5th ed.).

Anshel, M. H. (2000). A conceptual model and implications for coping with stressful events in

police work. *Criminal Justice Behavior International Journal*, *27*, 375-400.

https://doi.org/10.1177/0093854800027003006

Anshel, M. H. (2011) The disconnected values model: A brief intervention for improving healthy

habits and coping with stress in law enforcement. In: J. Kitaeff (Ed.), *Handbook of police

psychology* (pp. 525-540). Routledge Psychology Press.

Anshel, M. H., Umscheid, D., & Brinthaupt, T. M. (2013). Effect of a combined coping skills

and wellness program on perceived stress and physical energy among police emergency

dispatchers: An exploratory study. *Journal of Police and Criminal Psychology*, *28*(1), 1-

14. https://doi.org/10.1007/s11896-012-9110-x

Arias, J. (2018). Emergency call-takers, dispatchers overcome staffing challenges, stressful

work. *Government Technology: State & Local Government News Articles*.

https://www.govtech.com/em/next-gen-911/-Emergency-Call-Takers-Dispatchers-

Overcome-Staffing-Challenges-Stressful-Work.html

Bandura, A. (1994). Self-efficacy. In V. S. Ramachaudran (Ed.), *Encyclopedia of human

behavior* (Vol. 4, pp. 71-81). Academic Press. (Reprinted in *Encyclopedia of mental

health*, by H. Friedman [Ed.], 1998)

Beck, A. T., & Bredemeier, K. (2016). A unified model of depression: Integrating clinical, cognitive, biological, and evolutionary perspectives. *Clinical Psychological Science*, *4*(4), 596-619. https://doi.org/10.1177/2167702616628523

Beck, S. L., Schwartz, A. L., Towsley, G., Dudley, W., & Barsevick, A. (2004). Psychometric evaluation of the Pittsburgh Sleep Quality Index in cancer patients. *Journal of Pain and Symptom Management*, *27*(2), 140-148. https://doi.org/10.1016/j.jpainsymman.2003.12.002

Berger, W., Coutinho, E. S. F., Figueira, I., Marques-Portella, C., Luz, M. P., Neylan, T. C., Marmar, C. R., & Mendlowicz, M. V. (2012). Rescuers at risk: A systematic review and meta-re- gression analysis of the worldwide current prevalence and correlates of PTSD in rescue workers. *Social Psychiatry and Psychiatric Epidemiology*, *47*(6), 1001-1011. https://doi.org/10.1007/s00127-011-0408-2

Birmes, P. J., Brunet, A., Coppin-Calmes, D., Arbus, C., Coppin, D., Charlet, J.-P., Vinnemann, N., Juchet, H., Laque, D., & Schmitt, L. (2005). Symptoms of peritraumatic and acute stress among victims of an industrial disaster. *Psychiatric Services, 56*, (1) 93-95. https://doi.org/10.1176/appi.ps.56.1.93

Blevins, C. A., Weathers, F. W., Davis, M. T., Witte, T. K., & Domino, J. L. (2015). The posttraumatic stress disorder checklist for DSM-5 (PCL-5): Development and Initial psychometric evaluation. *Journal of Traumatic Stress*, *28*(6), 489-498. https://doi.org/10.1002/jts.22059

Brewin, C. R., Andrews, B., & Valentine, J. D. (2000). Meta-analysis of risk factors for posttraumatic stress disorder in trauma-exposed adults. *Journal of Consulting and Clinical Psychology, 68,* 748-766. https://doi.org/10.1037/0022-006X.68.5.748

Bronfenbrenner, U. (1977). Toward an experimental ecology of human development. *American Psychologist, 32*, 513-531. https://doi.org/10.1037/0003-066X.32.7.513

Brofenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design.* Harvard University Press.

Brooks, M. (2018). *Rethinking posttraumatic growth: Psychological processes, outcomes and individual differences between survivors of multiple types of adverse events* [Unpublished doctoral dissertation]. University of Central Lancashire.

Brunet, A., Weiss, D. S., Metzler, T. J., Best, S. R., Neylan, T. C., Rogers, C., Fagan, J., & Marmar, C. R. (2001). The Peritraumatic Distress Inventory: A proposed measure of PTSD Criterion A2. *American Journal of Psychiatry*, *158*, 1480-1485. https://doi.org/10.1176/appi.ajp.158.9.1480

Burke, T. W. (1995). Dispatcher stress. *The FBI Law Enforcement Bulletin*, np. http://findarticles.com/p/articles/mi_m2194/is_n10_v64/ai_17757180/?tag=content;col1

Burque, B., Baker, M. T., & Van Hasselt, V. B. (2014). Critical incident stress debriefing: What is the state of the science? In S. M. Freeman Clevenger, L. Miller, B. A. Moore, & A. Freeman (Eds.). *Behind the badge: A psychological treatment handbook for law enforcement officers* (pp. 92–120). Routledge.

Buysse, D. J., Reynolds III, C. F., Monk, T. H., Berman, S. R., & Kupfer, D. J. (1989). The pittsburgh sleep quality index: A new instrument for psychiatric practice and research. *Psychiatry Research*, *28*(2), 193-213. https://doi.org/10.1016/0165-1781(89)90047-4

Buysse, D. J., Reynolds III, C. F., Monk, T. H., Hoch, C. C., Yeager, A. L., & Kupfer, D. J. (1991). Quantification of subjective sleep quality in healthy elderly men and women

using the Pittsburgh Sleep Quality Index (PSQI). *Sleep*, *14*, 331-338.

https://doi.org/10.1093/sleep/14.4.331

Carlier, I. V., Lamberts, R. D., & Gersons, B. P. (1997). Risk factors for posttraumatic stress

symptomatology in police officers: A prospective analysis. *The Journal of Nervous and*

Mental Disease, *185*(8), 498-506. https://doi.org/10.1097/00005053-199708000-00004

Carver, C. S., & Scheier, M. F. (1994). Situational coping and coping dispositions in a stressful

transaction. *Journal of Personality and Social Psychology, 66,* 184-195.

https://doi.org/10.1037/0022-3514.66.1.184

Centers for Disease Control and Prevention. (2006). Health hazard evaluation of police officers

and firefighters after Hurricane Katrina–New Orleans, Louisiana, October 17-28 and

November 30-December 5, 2005. *Morbidity and Mortality Weekly Report, 55*(16), 456-

458. https://www.cdc.gov/mmwr/preview/mmwrhtml/mm5516a4.htm

Chronister, J., Chou, C. C., Kwan, K. L., Lawton, M., & Silver, K. (2015). The meaning of social

support for persons with serious mental illness. *Rehabilitation Psychology, 60,* 232-245.

https://doi.org/10.1037/rep0000038

Cohen J. (1992). Statistical Power Analysis. *Current Directions in Psychological Science*,

1(3):98-101. https://doi.org/10.1111/1467-872.ep10768783

Coyne, J. C., & Racioppo, M. W. (2000). Never the twain shall meet? Closing the gap between

coping research and clinical intervention research. *American Psychologist, 55,* 655-664.

https://doi.org/10.1037/0003-066X.55.6.655

Creamer, M., McFarlane, A. C., & Burgess, P. (2005). Psychopathology following trauma: The

role of subjective experience. *Journal of Affective Disorders*, *86*, 175-182.

https://doi.org/10.1016/j.jad.2005.01.015

Cutrona, C. E., & Russell, D. W. (1987). The provisions of social relationships and adaptation to stress. *Advances in Personal Relationships*, *1*(1), 37-67.

Davidson, P. (2018, September 24). With 911 dispatchers in short supply, average response time is slower. *USA Today.* https://www.usatoday.com/story/money/2018/09/24/911-centers-struggle-hire-operators-slowing-response/1196541002/

Davis, J. B. (2005). Finding calm after the call. *American Bar Association Journal, 91*(3), 75. https://www.abajournal.com/magazine/article/finding_calm_after_the_call/?icn=most_read

Davis, L., & Brekke, J. (2014). Social support and functional outcome in severe mental illness: The mediating role of proactive coping. *Psychiatry Research*, *215*(1), 39-45. https://doi.org/10.1016/j.psychres.2013.09.010

de Kloet, E. R., Joëls, M., & Holsboer, F. (2005). Stress and the brain: From adaptation to disease. *Nature Reviews Neuroscience*, *6*, 463-475. https://doi.org/10.1038/nrn1683

DeVries, A. C. & Glasper, E. R., & Detillion, C. E. (2003). Social modulation of stress responses. *Physiology & Behavior, 79*, 399-407. https://doi.org/10.1016/S0031-9384(03)0015

Dicks, R. L. H. (2014). *Prevalence of PTSD symptoms in Canadian 911 operators* [Unpublished master's dissertation]. University of the Fraser Valley.

Dvoskina, M., & Cole, G. (2020). Introduction of facility therapy dogs to 911 communication centers: A proposal. *Traumatology*, *26*(1), 147-151. https://doi.org/10.1037/trm0000215

Ehlers, A., & Clark, D. M. (2000). A cognitive model of posttraumatic stress disorder. *Behavior Research and Therapy, 38*, 319-345. https://doi.org/10.1016/S0005-7967(99)00123-0

Ellenbogen, J. M. (2005). Cognitive benefits of sleep and their loss due to sleep deprivation. *Neurology*, *64*(7), E25-E27. https://doi.org/10.1212/01.WNL.0000159942.64562.AD

Eriksen, H. R., Olff, M., Murison, R., & Ursin, H. (1999). The time dimension in stress responses: relevance for survival and health. *Psychiatry Research, 85*, 39-50. https://doi.org/10.1016/S0165-1781(98)00141-3

Fay, J., Kamena, M. D., Benner, A., & Buscho, A. (2006). A residential milieu treatment approach for first-responder trauma. *Traumatology, 12*(3), 255-262. https://doi.org/10.1177/1534765606294991

Flory, J. D., & Yehuda, R. (2015). Comorbidity between post-traumatic stress disorder and major depressive disorder: Alternative explanations and treatment considerations. *Dialogues in Clinical Neuroscience, 17,* 141-150.

Folkman, S., & Lazarus, R. (1985). If it changes it must be a process: Study of emotion and coping during three stages of a college examination. *Journal of Personality and Social Psychology, 48,* 150-170.

Folkman, S., & Moskowitz, J. T. (2004). Coping: Pitfalls and promises. *Annual Review of Psychology, 55*, 745-774. https://doi.org/10.1146/annurev.psych.55.090902.141456

Forslund, K., Kihlgren, A., & Kihlgren, M. (2004). Operators' experiences of emergency calls. *Journal of Telemedicine and Telecare, 10*, 290-297. https://doi.org/10.1258/1357633042026323

Fullerton, C. S., Ursano, R. J., & Wang, L. (2004). Acute stress disorder, posttraumatic stress disorder, and depression in disaster or rescue workers. *American Journal of Psychiatry*, *161*(8), 1370-1376. https://doi.org/10.1176/appi.ajp.161.8.1370

Gallagher, E. (2014). Marion County working to cut turnover rate of 911 dispatchers. *Time West*

   Virginian. https://www.timeswv.com/news/local_news/marion-county-working-to-cut-

   turnover-rate-of-dispatchers/article_48b16d49-06f0-5253-8672-75006763b807.html

Gersons, B. P. (1989). Patterns of PTSD among police officers following shooting incidents: A

   two-dimensional model and treatment implications. *Journal of Traumatic Stress, 2*(3),

   247-257. https://doi.org/10.1037/e609942012-066

Grant, D. M., Wingate, L. R., Rasmussen, K. A., Davidson, C. L., Slish, M. L., Rhoades-

   Kerswill, S. Mills, A. C., & Judah, M. R. (2013). An examination of the reciprocal

   relationship between avoidance coping and symptoms of anxiety and depression. *Journal*

   of Social and Clinical Psychology, 32, 878-896.

   https://doi.org/10.1521/jscp.2013.32.8.878

Guay, S., Billette, V., & Marchand, A. (2006). Exploring the links between posttraumatic stress

   disorder and social support: Processes and potential research avenues. *Journal of*

   Traumatic Stress, *19*(3), 327-338. https://doi.org/10.1002/jts.20124

Gutner, C. A., Rizvi, S. L., Monson, C. M., & Resick, P. A. (2006). Changes in coping strategies,

   relationship to the perpetrator, and posttraumatic distress in female crime victims.

   Journal of Traumatic Stress, 19, 813-823. https://doi.org/10.1002/jts.20158

Härmä, M., Tenkanen, L., Sjo˙blom, T., Alikoski, T., & Heinsalmi, P. (1998). Combined effects

   of shift work and life-style on the prevalence of insomnia, sleep deprivation and daytime

   sleepiness. *Scandinavian Journal of Work, Environment, and Health*, *4*, 300-307.

   https://www.jstor.org/stable/40966779

Hassija, C. M., Luterek, J. A., Naragon-Gainey, K., Moore, S. A., & Simpson, T. (2012). Impact

   of emotional approach coping and hope on PTSD and depression symptoms in a trauma

exposed sample of veterans receiving outpatient VA mental health care services. *Anxiety, Stress & Coping, 25*(5), 559-573. https://doi.org/10.1080/10615806.2011.621948

Haugen, P. T., Evces, M., & Weiss, D. S. (2012). Treating posttraumatic stress disorder in first responders: A systematic review. *Clinical Psychology Review, 32*(5), 370-380. https://doi.org/10.1016/j.cpr.2012.04.001

Henderson, A. S. (1992). Social support and depression. In H. O. F. Veil & U. Baumann (Eds.), *Meaning and measurement of social support*. Hemisphere.

Holahan, C. J., & Moos, R. H. (1981). Social support and psychological distress: A longitudinal analysis. *Journal of Abnormal Psychology, 90*(4), 365-370. https://doi.org/10.1037/0021-843X.90.4.365

Horneffer, K. J., & Fincham, F. D. (1995). Construct of attributional style in depression and marital distress. *Journal of Family Psychology*, *9*, 186-195. https://doi.org/10.1037/0893-3200.9.2.186

Hostinar, C. E., & Gunnar, M. R. (2013). Future directions in the study of social relationships as regulators of the HPA axis across development. *Journal of Clinical Child & Adolescent Psychology, 42*(4), 564-575. https://doi.org/10.1080/15374416.2013.804387

Iob, E., Kirschbaum, C., & Steptoe, A. (2018). Positive and negative social support and HPA-axis hyperactivity: Evidence from glucocorticoids in human hair. *Psychoneuroendocrinology*, *96*, 100-108. https://doi.org.ezproxy.pcom.edu/10.1016/j.psyneuen.2018.06.008

Jenkins, S. R. (1997). Coping and social support among emergency dispatchers: Hurricane Andrew. *Journal of Social Behaviors and Personality, 12,* 201-216.

Jones, S., Nagel, C., McSweeney, J., & Curran, G. (2018). Prevalence and correlates of psychiatric symptoms among first responders in a southern state. *Archives of Psychiatric Nursing*, *32*, 828-835. https://doi.org/10.1016/j.apnu.2018.06.007

Joseph, S., Williams, R. M. (Oxon), D. P., & Yule, W. (1997). Understanding post-traumatic stress: a psychosocial perspective on PTSD and treatment. *Wiley.*

Klimley, K. E., Van Hasselt, V. B., & Stripling, A. M. (2018). Posttraumatic stress disorder in police, firefighters, and emergency dispatchers. *Aggression and Violent Behavior*, *43*, 33-44. https://doi.org/10.1016/j.avb.2018.08.005

Kondrat, D. C., Sullivan, W. P., Wilkins, B., Barrett, B. J., & Beerbower, E. (2018). The mediating effect of social support on the relationship between the impact of experienced stigma and mental health. *Stigma and Health*, *3*(4), 305-314. https://doi.org/10.1037/sah0000103

Kroenke, K., Spitzer, R. L., Williams, J. B. W., Palacios, J. E., Khondoker, M., Achilla, E., Tylee, A., & Hotopf, M. (2016). Patient Health Questionnaire--9. PLoS ONE, 11(7), 1–13.

Kroenke, K., Strine, T. W., Spitzer, R. L., Williams, J. B. W., Berry, J. T., & Mokdad, A. H. (2009). The PHQ-8 as a measure of current depression in the general population. *Journal of Affective Disorders*, *114*(1), 163-173. https://doi.org/10.1016/j.jad.2008.06.026

Krohne, H. W. (1993) Vigilance and cognitive avoidance as concepts in coping research. In H. W. Krohne (Ed.), *Attention and avoidance* (pp. 19-50). Hogrefe & Huber.

Lepore, S. J. (2001). A social-cognitive processing model of emotional adjustment to cancer. In A. Baum & B. L. Andersen (Eds.), *Psychosocial interventions for cancer* (pp. 99-116). American Psychological Association. https://doi.org/10.1037/10402-006

Lepore, S. J., & Greenberg, M. A. (2002). Mending broken hearts: Effects of expressive writing on mood, cognitive processing, social adjustment, and mental health following a relationship breakup. *Psychology & Health, 17*, 547-560. https://doi.org/10.1080/08870440290025768

Lepore, S. J., Silver, R. C., Wortman, C. B., & Wayment, H. A. (1996). Social constraints, intrusive thoughts, and depressive symptoms among bereaved mothers. *Journal of Personality and Social Psychology, 70*, 271-282.

Levenson, R. L. (nd). Psychological issues in line-of-duty suicides. *Badge of Life Canada Library*. http://k9s4vets.files.wordpress.com/2013/02/levenson-psychological-issues-in-line-of-duty- suicides.pdf

Lewis, S. & Cooper, C. L. (1999). The work–family research agenda in changing contexts. *Journal of Occupational Health Psychology*, *4*(4), 382-393. https://doi.org/10.1037/1076-8998.4.4.382

Lilly, M. M., & Allen, C. E. (2015). Psychopathology and psychological inflexibility in 9-1-1 telecommunicators. *Journal of Traumatic Stress, 28*, 1-5. https://doi.org/10.1002/jts.22004

Lilly, M. M., & Graham-Bermann, S. A. (2010). Intimate partner violence and PTSD: The moderating role of emotion-focused coping. *Violence and Victims, 25*, (5), 604-616. https://doi.org/10.1891/0886-6708.25.5.604

Littleton, H., Horsley, S., John, S., & Nelson, D. (2007). Trauma coping strategies and psychological distress: A meta-analysis. *Journal of Traumatic Stress, 20*, 977-988. https://doi.org/10.1002/jts.20276

Lupien, S. J., Maheu, F., Tu, M., Fiocco, A., & Schramek, T. E. (2007). The effects of stress and

    stress hormones on human cognition: Implications for the field of brain and cognition.

    Brain and Cognition, *65*, 209-237. https://doi.org/10.1016/j.bandc.2007.02.007

Maciejewski, P., Zhang, B., Block, S., Prigerson, H. (2007). An empirical examination of the

    stage theory of grief. *Journal of the American Medical Association*, *297*, 716-723.

    https://doi:10.1001/jama.297.7.716

Maia, D. B., Marmar, C. R., Metzler, T., Nóbrega, A., Berger, W., Mendlowicz, M. V.,

    Coutinho, E. S. F., & Figueira, I. (2007). Post-traumatic stress symptoms in an elite unit

    of Brazilian police officers: Prevalence and impact on psychosocial functioning and on

    physical and mental health. *Journal of Affective Disorders, 9*7(1), 241-245.

    https://doi.org/10.1016/j.jad.2006.06.004

Mann, M. (2016). Should dispatchers be officially classified as first responders? *Police One.*

    https://www.police1.com/police-products/communications/articles/should-dispatchers-

    be-officially-classified-as-first-responders-wVUyKz1lAZZtHnS8/

Manocchia, M., Keller, S., & Ware, J. E. (2001). Sleep problems, health-related quality of life,

    work functioning and health care utilization among the chronically ill. *Quality of Life*

    Research: An International Journal of Quality of Life Aspects of Treatment, Care and

    Rehabilitation, *10*(4), 331-345. https://10.1023/a:1012299519637

Marquié, J. C., Foret, J., & Queinnec, Y. (1999). Effects of age, working hours, and job content

    on sleep: A pilot study. *Experimental Aging Research, 25*(12), 421-427.

    https://doi.org/10.1080/036107399243896

Martin, M., Marchand, A., Boyer, R., & Martin, N. (2009). Predictors of the development of posttraumatic stress disorder among police officers. *Journal of Trauma & Dissociation, 10*(4), 451-468. https://doi.org/10.1080/15299730903143626

Masel, C. N., Terry, D. J., & Gribble, M. (1996). The effects of coping on adjustment: Re-examining the goodness of fit model of coping effectiveness. *Anxiety, Stress, and Coping, 9,* 279-300. https://doi.org/10.1080/10615809608249407

Matricciani, L., Bin, Y. S., Lallukka, T., Kronholm, E., Wake, M., Paquet, C., Dumuid, D., & Olds, T. (2018). Rethinking the sleep-health link. *Sleep Health: Journal of the National Sleep Foundation*, *4*(4), 339-348. https://doi.org/10.1016/j.sleh.2018.05.004

McEwen, B. S. (2006). Protective and damaging effects of stress mediators: Central role of the brain. *Dialogues in Clinical Neuroscience*, *8*(4), 367-381. https://10.31887/DCNS.2006.8.4/bmcewen

McFarlane, A. C., & Papay, P. (1992). Multiple diagnoses in posttraumatic stress disorder in the victims of a natural disaster. *Journal of Nervous and Mental Disease, 180*(8), 498-504. https://doi.org/10.1097.00005053-199208000-00004

Morin, C. M., Bootzin, R. R., Buysse, D. J., Edinger, J. D., Espie, C. A., & Lichstein, K. L. (2006). Psychological and behavioral treatment of insomnia: Update of the recent evidence (1998-2004). *Sleep, 29*, 1398-1414. https://doi.org/10.1093/sleep/29.11.1398

Murawski, B., Wade, L., Plotnikoff, R. C., Lubans, D. R., & Duncan, M. J. (2018). A systematic review and meta-analysis of cognitive and behavioral interventions to improve sleep health in adults without sleep disorders. *Sleep Medicine Reviews*, *40*, 160-169. https://doi.org/10.1016/j.smrv.2017.12.003

National Center for PTSD. (2018, September 13). How common is PTSD is adults? *U.S. Department of Veteran Affairs.*

https://www.ptsd.va.gov/understand/common/common_adults.asp

Noronha Liberalesso, P. B., Klagenberg D'Andrea, K. F., Cordeiro, M. L., Zeigelboim, B. S., Mendes Marques, J., & Jurkiewicz, A. L. (2012). Effects of sleep deprivation on central auditory processing. *BMC Neuroscience*, *13*(1), 83-89. https://doi.org/10.1186/1471-2202-13-83

Ozer, E. J., Best, S. R., Lipsey, T. L., & Weiss, D. S. (2008). Predictors of posttraumatic stress disorder and symptoms in adults: A meta-analysis. *Psychological Bulletin, 129*(1), 52-73. https://doi.org/10.1037/0033-2909.129.1.5

Payne, D. M. (1993). Role disequilibrium among police dispatchers. *Policing: An International Journal of Police Strategies & Management*, 99-112.

Petty, A. (2012). Demands, stress of the job means high turnover for emergency dispatchers. https://herald-review.com/news/local/demands-stress-of-the-job-means-high-turnover-for-emergency/article_56aa9990-3142-11e2-a107-0019bb2963f4.html

Pierce, H., & Lilly, M. M. (2012). Duty-related trauma exposure in 911 telecommunicators: Considering the risk for posttraumatic stress. *Journal of Traumatic Stress*, *25*(2), 211-215. https://doi.org/10.1002/jts.21687

Poudel-Tandukar, K., Jacelon, C. S., Bertone-Johnson, E. R., Gautam, B., Palmer, P. H., & Hollon, S. D. (2020). Coping strategies and stress among resettled Bhutanese adults in Massachusetts. *American Journal of Orthopsychiatry*. https://doi.org/10.1037/ort0000453

Reul, J. M. H. M., Bilang-Bleuel, A., Droste, S., Linthorst, A. C. E., Holsboer, F., & Gesing, A. (2000). New mode of hypothalamic-pituitary-adrenocortical axis regulation: Significance for stress-related disorders. *Zeitschrift für Rheumatologie*, *59*(2), 22-25.

Reynolds, C. F., Hoch, C. C., Buysse, D. J., Houck, P. R., Schlernitzauer, M., Pasternak, R. E., Frank, E., Mazumdar, S., & Kupfer, D. J. (1993). Sleep after spousal bereavement: A study of recovery from stress. *Biological Psychiatry*, *34*(11), 791-797. https://doi.org/10.1016/0006-3223(93)90068-O

Ribet, C., & Derriennic, F. (1999). Age, working conditions, and sleep disorders: A longitudinal analysis in the French cohort ESTEV. *Sleep*, *22*(4), 491-504. https://doi.org/10.1093/sleep/22.4.491

Robinson, H. M., Sigman, M. R., & Wilson, J. P. (1997). Duty-related stressors and PTSD symptoms in suburban police officers. *Psychological Reports, 81*(3), 835-845. https://doi.org/10.2466/pr0.1997.81.3.835

Robinson-Kitt, L. (2009). *Breaking the silence: Insights into the impact of being a firefighter on men's mental health* [Unpublished doctoral dissertation]. University of British Columbia. https://10.14288/1.0053826

Rojas, S. M., Bujarski, S., Babson, K. A., Dutton, C. E., & Feldner, M. T. (2014). Understanding PTSD comorbidity and suicidal behavior: Associations among histories of alcohol dependence, major depressive disorder, and suicidal ideation and attempts. *Journal of Anxiety Disorders, 28,* 318-325. http://doi.org/10.1016/j.janxdis.2014.02.004

Römer, B., Lewicka, S., Kopf, D., Lederbogen, F., Hamann, B., Gilles, M., Shilling, C., Onken, V., Frankhauser, P., & Deuschle, M. (2009). Cortisol metabolism in depressed patients

and healthy controls. *Neuroendocrinology, 90*(3), 301-306.

https://doi.org/10.1159/000235904

Roth, S., & Cohen L. J. (1986). Approach, avoidance, and coping with stress. *American*

Psychology 41, 813-819. https://doi.org/10.1037/0003-066X.41.7.813

Rubinstein, M. L., & Selwyn, P. A. (1998). High prevalence of insomnia in an outpatient

population with HIV infection. *Journal of Acquired Immune Deficiency Syndromes and*

Human Retrovirology: Official Publication of the International Retrovirology

Association, *19*(3), 260-265. https://www.natap.org/2008/HIV/041108_01.htm

Rytwinski, N. K., Scur, M. D., Feeny, N. C., & Youngstrom, E. A. (2013). The co-occurrence of

major depressive disorder among individuals with posttraumatic stress disorder: A meta-

analysis. *Journal of Traumatic Stress*, *26*(3), 299-309. https://doi.org/10.1002/jts.21814

Salary.com. (2019). Hourly wage for dispatcher salary in the United States.

https://www.salary.com/research/salary/benchmark/dispatcher-hourly-wages

Sapolsky, R. M. (1996). Why stress is bad for your brain. *Science, 273,* 749-750.

https://10.1126/science.273.5276.749

Sattler, D. N., Boyd, B., & Kirsch, J. (2013). Trauma-exposed firefighters: Relationships among

posttraumatic growth, posttraumatic stress, resource availability, coping and critical

incident stress debriefing experience. *Stress and Health, 30*(5), 356-365.

https://doi.org/10.1002/smi.2608

Scharlau, F., Pietzner, D., Vogel, M., Gaudl, A., Ceglarek, U., Thiery, J., Kratzsch, J., Hiemisch,

A., & Kiess, W. (2018). Evaluation of hair cortisol and cortisone change during

pregnancy and the association with self-reported depression, somatization, and stress

symptoms. *Stress, 21*(1), 43-50. https://doi.org/10.1080/10253890.2017.1392507

Schnider, K. R., Elhai, J. D., & Gray, M. J. (2007). Coping style use predicts posttraumatic stress and complicated grief symptom severity among college students reporting a traumatic loss. *Journal of Counseling Psychology*, *54*(3), 344-350. https://doi.org/10.1037/0022-0167.54.3.344

Schnurr, P. P., Ford, J. D., Friedman, M. J., Green, B. L., Dain, B. J., & Sengupta, A. (2000). Predictors and outcomes of post- traumatic stress disorder in World War II veterans exposed to mustard gas. *Journal of Consulting and Clinical Psychology*, *68*, 258-268. https://doi.org/10.1037/0022-006X.68.2.258

Schnurr, P. P., Lunney, C. A., & Sengupta, A. (2004). Risk factors for the development versus maintenance of posttraumatic stress disorder. *Journal of Traumatic Stress, 17*, 85-95. https://doi.org/10.1023/B:JOTS.0000022614.21794.f4

Scully, P. J. (2011). Taking care of staff: A comprehensive model of support for paramedics and emergency medical dispatchers. *Traumatology*, *17*(4), 35-42. https://doi:10.1177/1534765611430129

Semmer, N. K., Elfering, A., Jacobshagen, N., Perrot, T., Beehr, T. A., & Boos, N. (2008). The emotional meaning of instrumental social support. *International Journal of Stress Management*, *15*(3), 235-251. https://doi.org/10.1037/1072-5245.15.3.235

Shakespeare-Finch, J., Rees, A., & Armstrong, D. (2015). Social support, self-efficacy, trauma and well-being in emergency medical dispatchers. *Social Indicators Research*, *123*(2), 549-565. https://doi.org/10.1007/s11205-014-0749-9

Shuler, S., & Davenport Sypher, B. (2000). Seeking emotional labor: When managing the heart enhances the work experience. *Management Communication Quarterly, 14*(1), 50-89. https://doi.org/10.1177/0893318900141003

Snyder, C. R., & Pulvers, K. M. (2001). Dr. Seuss, the coping machine, and "Oh, the Places You'll Go." In C. R. Snyder (Ed.), *Coping with stress: Effective people and processes* (pp. 3-29). Oxford University Press.

Soria, J. R. (n.d.). Emergency Dispatcher Vulnerabilities. *Office of Suicide & Violence Prevention*, 14. https://www.nova.edu/suicideprevention/forms/newsletter-winter-2020.pdf#page=14

Spitzer, R. L. (1999). Patient health questionnaire: PHQ. New York State Psychiatric Institute.

Spitzer, R.L., Kroenke, K., & Williams, J.B.W. (1999). Patient health questionnaire study group. Validity and utility of a self-report version of PRIME-MD: The PHQ Primary Care Study. *Journal of American Medicine Association*, *282,* 1737-44. https://doi:10.1001/jama.282.18.1737

Stafford, M., Gardner, M., Kumari, M., Kuh, D., & Ben-Shlomo, Y. (2013). Social isolation and diurnal cortisol patterns in an ageing cohort. *Psychoneuroendocrinology, 38*, 2737–2745. https://doi.org/10.1016/j.psyneuen.2013.07.002

Staufenbiel, S. M., Koenders, M. A., Giltay, E. J., Elzinga, B. M., Manenschijn, L., Hoencamp, E., van Rossum, E. F. C., & Spijker, A. T. (2014). Recent negative life events increase hair cortisol concentrations in patients with bipolar disorder. *Stress, 17*, 451-459 https://doi.org/10.3109/10253890.2014.968549

Stein, M. B., Chartier, M., & Walker, J. R. (1993). Sleep in nondepressed patients with panic disorder: Systematic assessment of subjective sleep quality and sleep disturbance. *Sleep 16*, 724-726. https://doi.org/10.1093/sleep/16.8.724

Stein, M. B., Kroft, C. D., & Walker, J. R. (1993). Sleep impairment in patients with social

    phobia. *Psychiatry Research*, *49,* 251-256. https://doi.org/10.1016/0165-1781(93)90065-

    O

Steinkopf, B., Reddin, R. A., Black, R. A., Van Hasselt, V. B., & Couwels, J. (2018).

    Assessment of stress and resiliency in emergency dispatchers. *Journal of Police and*

    Criminal Psychology, 33, 398-411. https://doi.org/10.1007/s11896-018-9255-3

Steptoe, A., Owen, N., Kunz-Ebrecht, S.R., & Brydon, L. (2004). Loneliness and

    neuroendocrine, cardiovascular, and inflammatory stress responses in middle-aged men

    and women. *Psychoneuroendocrinology 29* (5), 593-611. https://doi.org/10.1016/S0306-

    4530(03)00086-6

Strine, T. W., & Chapman, D. P. (2005). Associations of frequent sleep insufficiency with

    health-related quality of life and health behaviors. *Sleep Medicine*, *6*(1), 23-27.

    https://doi.org/10.1016/j.sleep.2004.06.003

Taylor, M. J., Gardner, V., Clark, P., & McCombs, B. (2005). Staffing and retention in public

    safety communication centers.

    https://www.apcointl.org/doc/conference.documents/personnel-human- factor/283-

    Project-retains-effective-practices-guide-2005/file.html

Tedeschi, R. G., & Calhoun, L. G. (2004). Posttraumatic growth: Conceptual foundations and

    empirical evidence. *Psychological Inquiry, 15,* 1-18.

    http://doi.org/10.1207/s15327965pli1501_01

Theorell, T., Perski, A., Åkerstedt, T., Sigala, F., Ahlberg-Hultén, G., Svensson, J., & Enereth. P.

    (1988). Changes in job strain in relation to changes in physiological state. *Scandinavian*

Journal of Work Environment, & Health, 14, 189-196.

http://www.jstor.org/stable/40965560

Tobin, D. L., Holroyd, K.A., Reynolds, R.V., Wigul, J. K. (1989). The hierarchical factor

structure of the coping strategies inventory. *Cognitive Therapy and Research*, *13,* 343-

361. https://doi.org/10.1007/BF01173478

Troxell, R. M. (2008). *Indirect exposure to the trauma of others: The experiences of 9-1-1*

telecommunicators [Unpublished doctoral dissertation]. University of Illinois at Chicago.

Ullman, S. E., Townsend, S. M., Filipas, H. H., & Starzynski, L. L. (2007). Structural models of

the relations of assault severity, social support, avoidance coping, self-blame, and PTSD

among sexual assault survivors. *Psychology of Women Quarterly, 31*, 23-37

https://doi.org/10.1111/j.1471-6402.2007.00328.x

University of Phoenix. (2017). Majority of First Responders Face Mental Health Challenges in

the Workplace. https://www.phoenix.edu/about_us/media-center/news/uopx-releases-

first-responder-mental-health-survey-results.html

Vanaelst, B., Michels, N., De Vriendt, T., Huybrechts, I., Vyncke, K., Sioen, I., Bammann, K.,

    Rivet, N., Raul, J., Molnar, D., & De Henauw, S. (2013). Cortisone in hair of elementary

    school girls and its relationship with childhood stress. *European Journal of Pediatrics,*

    172, 843-846. https://doi.org/10.1007/s00431-013-1955-1

Vieweg, W. V. R., Julius, D. A., Fernandez, A., Beatty-Brooks, M., Hettema, J. M., &

    Pandurangi, A. K. (2006). Posttraumatic stress disorder: Clinical features, patho-

    physiology, and treatment. *The American Journal of Medicine, 119*(5), 383-390.

    https://doi.org/10.1016/j.amjmed.2005.09.027

Vogel, M., Braungardt, T., Meyer, W., & Schneider, W. (2012). The effects of shift work on

    physical and mental health. *Journal of Neural Transmission*, *119*(10), 1121-1132.

    https://doi.org.ezproxy.pcom.edu/10.1007/s00702-012-0800-4

Voydanoff, P. (2001). Conceptualizing community in the context of work and family.

    Community, Work & Family, *4*(2), 133-156. https://doi.org/10.1080/713658928

Wagner, D., Heinrichs, M., & Ehlert, U. (1998). Prevalence of symptoms of posttraumatic stress

    disorder in German professional firefighters. *American Journal of Psychiatry, 155*(12),

    1727-1732. https://doi.org/10.1176/ajp.155.12.1727

Weathers, F. W., Litz, B. T., Keane, T. M., Palmieri, P. A., Marx, B. P., & Schnurr, P. P. (2013).

    The PTSD Checklist for DSM-5 (PCL-5) – Standard [Measurement instrument].

    https://www.ptsd.va.gov.10

Weibel, L., Gabrion, I., Auusedat, M., & Kreutz, G. (2003) Work-related stress in an emergency

    medical dispatch center. *Annals of Emergency Medicine*, (4), 500-506.

    https://doi.org/10.1067/mem.2003.109

Williams, R., & Joseph, S. (1999). Conclusions: An integrative psychosocial model of PTSD. In

    W. Yule (Ed.), *Post-traumatic stress disorders: Concepts and therapy* (pp. 297-314).

    Wiley.

Yan, K., & Wang, J. (2005). A path analysis on life events, negative automatic thoughts, coping

    style and depression. *Psychological Development and Education*, (1), 18.

    http://en.cnki.com.cn/Article_en/CJFDTotal-XLFZ200501018.htm

APPENDIX

Recruitment Post

Margarett, M.S., psychology doctoral student at the Philadelphia College of Osteopathic Medicine (PCOM), is currently seeking 911 operators and dispatchers to participate in a brief (15-20 minute) online survey for her doctoral dissertation. The research project is investigating possible risk and protective factors associated with psychosocial functioning. Eligible participants must be working actively as 911 operators or dispatchers and be fluent in English. This study will be anonymous and confidential, and participants may withdraw from the study at any time. Following the study, if interested, participants will be given the opportunity to enter their names for two $40 Visa gift cards that will be raffled upon completion of the study. This raffle is separate from the survey and participants will not be able to be identified. This raffle will not be linked to survey data. This study has been reviewed and approved by the PCOM institutional review board. Please follow the link to be directed to the online research study.