

5-2022

The Effect of Trauma on the Mental Health of Forensic Scientists

Carley Sistrunk
The University of Southern Mississippi

Follow this and additional works at: https://aquila.usm.edu/honors_theses



Part of the [Other Social and Behavioral Sciences Commons](#)

Recommended Citation

Sistrunk, Carley, "The Effect of Trauma on the Mental Health of Forensic Scientists" (2022). *Honors Theses*. 831.

https://aquila.usm.edu/honors_theses/831

This Honors College Thesis is brought to you for free and open access by the Honors College at The Aquila Digital Community. It has been accepted for inclusion in Honors Theses by an authorized administrator of The Aquila Digital Community. For more information, please contact Joshua.Cromwell@usm.edu.

The Effect of Trauma on the Mental Health of Forensic Scientists

by

Carley Sistrunk

A Thesis
Submitted to the Honors College of
The University of Southern Mississippi
in Partial Fulfillment
of Honors Requirements

May 2022

Approved by:

Joshua Hill, Ph.D., Thesis Advisor,
School of Criminal Justice, Forensic Science and
Security

Janet Donaldson, Ph.D., Interim Director,
School of Criminal Justice, Forensic Science and
Security

Sabine Heinhorst, Ph.D., Interim Dean
Honors College

ABSTRACT

The purpose of this thesis was to determine the existence of any correlation between forensic scientists experiencing trauma and levels of mental health disorders, such as anxiety, depression, and PTSD. A survey created in Qualtrics with demographic questions and measurement questionnaires for each mental health disorder was utilized for this study. While there was little statistical analysis due to a small sample size, results showed a correlation between experiencing anxiety and PTSD. Research also illustrated that there were no respondents that reported having no level of the mental health disorders listed.

Keywords: forensic scientist, trauma, mental health, anxiety, depression, PTSD

DEDICATION

To present and future forensic scientists: I hope this helps you understand our field a little better.

ACKNOWLEDGMENTS

First and foremost, I would like to thank Dr. Joshua Hill for his support and guidance throughout the thesis process. I could not have done this without your help and constant positivity. Thank you for dealing with my random, rambling emails.

Thank you to the Honors College for preparing me for the thesis process throughout my four years at USM.

Thank you to the Mississippi Division of the International Association for Identification for distributing the survey for this thesis to their members. I could not have completed this research without their help.

A very special thank you to my family and friends who have listened to me rant, rave, and ramble about this thesis for over a year now. It probably got very old very fast, so I appreciate the patience and understanding.

TABLE OF CONTENTS

LIST OF TABLES	viii
LIST OF ILLUSTRATIONS	ix
LIST OF ABBREVIATIONS	x
CHAPTER I: INTRODUCTION	11
CHAPTER II: LITERATURE REVIEW	14
CHAPTER III: METHODOLOGY	26
CHAPTER IV: RESULTS	29
CHAPTER V: CONCLUSION	41
APPENDIX A: IRB Approval Letter	45
APPENDIX B: Effect of Trauma Survey	46
REFERENCES	60

LIST OF TABLES

Table 1: Sample Descriptives	29
Table 2: Demographic Descriptives.....	30
Table 3: Title Descriptives.....	31
Table 4: Correlation Between Anxiety and PTSD.....	36
Table 5: Levels of Anxiety and PTSD Across Various Jobs	39

LIST OF ILLUSTRATIONS

Figure 1: Distribution of Cases Worked.....	33
Figure 2: Distribution of Juvenile Cases.....	34
Figure 3: Distribution of Years in the Field.....	35
Figure 4: Anxiety Levels	37
Figure 5: PTSD Levels.....	38

LIST OF ABBREVIATIONS

APA	American Psychological Association
BLS	Bureau of Labor Statistics
COVID	Coronavirus Disease 2019
CSI	Crime Scene Investigation
EMT	Emergency Medical Technician
FBI	Federal Bureau of Investigation
GAD	Generalized Anxiety Disorder
IAI	International Association of Identification
IRB	Institutional Review Board
MDIAI	Mississippi Division of the International Association of Identification
NAMI	National Alliance on Mental Illness
NIMH	National Institute of Mental Health
OASH	Office on Women's Health
PTSD	Post-Traumatic Stress Disorder
SAMHSA	Substance Abuse and Mental Health Services Administration
USM	The University of Southern Mississippi
WHO	World Health Organization

CHAPTER I: INTRODUCTION

According to the FBI's Crime Data Explorer, there were 538,203 violent crime incidents in the year of 2020, including rape, sexual assault, robbery, assault, and murder. When these crimes are committed, there is a crime scene left behind. Each of these scenes must be investigated by both the police and the forensics team. They can be gruesome and traumatic, depending on the crime that has been committed, number of victims, and other factors. The forensic scientists that are investigating these crime scenes are dealing with these disturbing sights daily, meaning the trauma they are witnessing may be compounding upon itself. This repeated trauma can cause numerous problems, especially in terms of mental illnesses.

There has been a multitude of research completed on the effect of trauma on the mental health of several professions, especially police officers, firefighters, and other first responders. These are all highly stressful careers that typically deal with traumatic events. Perhaps because of this, the people who choose one of these careers tend to have higher incidences of mental health disorders (Skogstad, et. al., 2013; Torpey, 2016; Lee, et. al., 2020). Research has consistently demonstrated the negative effects of trauma on the mental health of those professionals mentioned above; however, the same research has not been conducted regarding forensic scientists. In fact, there is little to no research on the mental health of forensic scientists. There may be several reasons for this gap, including the fact that the fields most commonly researched, such as policing and firefighting, have been around for hundreds of years, with a "night watch" being created in 1636 and the first paid fire department being created in 1679, both in Boston (Klinoff, 2007; Potter, 2013). With hundreds of years and tens of thousands of workers, there has

been plenty of both time and information to conduct research on the effect trauma has on the mental health of people engaged in those professions. Comparatively, the modern field of forensics only began in the 1980s (Panneerchelvam & Norazmi, 2003). With less than fifty years as an established career field, there has not been sufficient opportunity for research to be conducted on those in the field.

Another reason there has been little research on the mental health of forensic scientists may be what is referred to as the "CSI effect." The CSI effect refers to the phenomenon that the exaggerated portrayal of forensics on television shows has led to a skewed idea of what forensics truly is, as well as what forensic scientists do (Saks & Schweitzer, 2007; Chesen, 2008). There is an abundance of television shows that include forensics, with many of them showing forensic scientists as individuals who remain in the lab analyzing evidence – rather than being out in the field. While this is a facet of forensic science, this has led to the misconception that forensic scientists are not exposed to the same traumas as police officers or other first responders. This mistaken belief is a likely reason there are so many misconceptions about forensic scientists and little research on their mental health (Roane & Morrison, 2005; Podlas, 2005)

Forensic science is a fast-growing field, with an expected 16% growth in employment from 2020 to 2030 according to the Bureau of Labor Statistics; faster than the average for all occupations (BLS, 2020). With the discipline already large and consistently growing, more and more people are working as forensic scientists. They deserve to know the risks involved in their career, including the potential effects that trauma can have on their mental health. As the literature stands now, there is a gap regarding this information.

The purpose of this thesis is to fill that gap in the research. This thesis will examine the mental health of forensic scientists, focusing on anxiety, depression, and post-traumatic stress disorder. The number of years in the field, the number of cases worked, and the number of cases involving juveniles are all factors that will be investigated in comparison to the instances of mental illnesses.

CHAPTER II: LITERATURE REVIEW

As the literature currently stands, there is a good deal of research on trauma and the effect it has on developing mental disorders. Various mental disorders, such as anxiety, depression, and post-traumatic stress disorder, have had plenty of research completed on them as well, with the most common mental disorders being anxiety disorders and depressive disorders (Davis Behavioral Health, 2020). With approximately one in five people in the United States experiencing a mental disorder in their lifetime, it's sensible that there are copious amounts of research on the subjects (NIMH, 2020). This number is for the general population; however, the prevalence of mental disorders in those who work in stressful careers, such as police officers or firefighters, is much higher (Henry, 2004; Stanley, Hom, & Joiner, 2015). As a result, there is a liberal amount of literature on the effect trauma has on the mental health of those in these professions, as well as the military and healthcare workers.

This literature review will cover the research that has been done on trauma and how it impacts the development of mental health disorders, specifically anxiety, post-traumatic stress disorder, and depression. It will also contain the research on the prevalence of these mental health disorders in those who tend to have highly stressful/traumatic careers. This includes police officers, military personnel, firefighters, emergency medical technicians, and healthcare workers.

Trauma

Trauma is defined as an emotional or psychological reaction to a devastating event, such as war, sexual assault, fatal accidents, or incidents of violence (Kleber, 2019). It is estimated that approximately 60.7% of men and 51.2% of women will experience at

least one traumatic event in their lives (Javidi & Yadollahie, 2012). When trauma affects a person, it can cause both short-term and long-term consequences. Short-term symptoms of a trauma response can include sadness, anxiety, confusion, disassociation, and exhaustion (SAMHSA, 2014). Some people have only these short-term, temporary effects; however, others have longer-lasting, sometimes permanent issues. The long-term problems can include issues that are both physical and mental.

Traumatic events can disrupt the body's homeostasis, which in turn disrupts several bodily functions. Most physical effects of trauma are those that are within the body, rather than the outside such as bruises or broken bones; therefore, it is not always obvious that trauma can and does physically affect someone. The body can have high levels of adrenal hormones and low levels of dopamine, which damages the immune system and the nervous system as well as other organ systems (Solomon & Hyde, 2005; Van der Kolk, 2013). Many studies have included physical scans of the brain that show measurable differences in the results, such as a decrease in volume, in those that have experienced trauma versus those that have not (Bremner, 1999). These differences can be seen in several areas of the brain, including but not limited to the hippocampus and prefrontal cortex (Rinne-Albers, et. al, 2013).

The mental issues that arise can be comprised of emotional dysfunction and mental disorders, among others. Emotional dysfunction, also known as emotional dysregulation, refers to the inability to regulate or control one's emotions (Williams, 2021). This can lead to emotional outbursts, as the one afflicted cannot handle the emotions they feel. Emotional dysregulation can also lend itself to the development of several other mental problems, such as anxiety, depression, suicidal thoughts, and/or

substance abuse (Williams, 2021). Substance abuse can be a form of self-medication with drugs and/or alcohol. Those who cannot control their emotions or how their emotions make them act can choose to attempt to medicate themselves using these substances; however, it is fairly easy to develop a substance abuse disorder (Khoury, Tang, Bradley, Cubells, & Ressler, 2010). The problems that can arise from trauma are serious and can affect someone for life.

Mental Health Issues

Worldwide, one in four people suffer from a mental illness, while the statistics in the United States are slightly better, with one in five individuals having mental health issues (WHO, 2001; NIMH, 2020). These numbers mean that millions of people all over the world suffer from some form of mental illness. The most common mental disorders fall under the umbrellas of anxiety disorders, which encompasses both general anxiety and post-traumatic stress disorder, and mood disorders, which encompasses depression (Davis Behavioral Health, 2020). When someone experiences trauma, they are more susceptible to developing these mental health issues (Kessler, et. al., 2010; Rosenberg, 2011).

Anxiety

Anxiety disorders are the most common mental health disorders in the United States (Davis Behavioral Health, 2020). Anxiety is defined as feelings of worry, nervousness, and/or fear about real or perceived issues (APA, 2020). Most people experience some form of anxiety in their lives, whether it be over a test, a disciplinary action, or an important event; however, when the anxiety is constant over things that most people would consider as inconsequential and it is causing interference with daily life, it

is classified as an anxiety disorder. According to the National Alliance on Mental Illness, approximately 19.1% of adults suffer from an anxiety disorder (2017). Common symptoms of an anxiety disorder can be mental/emotional or physical, with feelings of worry or dread, nausea, dizziness, and rapid heart rate (OASH, 2019). Experiencing trauma can be a major factor in the development of an anxiety disorder (SAMHSA, 2014). One of the most common anxiety disorders is referred to as generalized anxiety disorder or GAD. When one is diagnosed with GAD, the anxiety they experience can interfere with their ability to carry on with life normally (Akiskal, 1998; Arroll & Kendrick, 2018). While GAD encompasses emotional feelings, it can also cause physical ailments. Various aches and pains, such as stomachaches, headaches, and muscle aches, can be caused by GAD (NIMH, 2022).

There are several other mental disorders that fall under the umbrella of anxiety disorders, as anxiety is a common symptom of several other disorders. Obsessive-compulsive disorder (OCD) as well as post-traumatic stress disorder (PTSD) and agoraphobia are considered to be anxiety disorders because of the symptoms associated with these disorders (Arroll & Kendrick, 2018). All of these disorders have general feelings of anxiety as a symptom; therefore, they fall under the spectrum of anxiety disorders. Some of these disorders can be more severe than the others.

Being exposed to trauma can increase the probability that an individual will develop an anxiety disorder (Ayazi, Lien, Eide, Swartz, & Hauff, 2014). It is not guaranteed that someone will develop anxiety due to a traumatic event; however, it is more likely. It has also been found that trauma can worsen a pre-existing mental disorder,

particularly post-traumatic stress disorder, which is an anxiety disorder (Breslau, Peterson, & Schultz, 2008).

PTSD

Post-traumatic stress disorder (PTSD) is an anxiety disorder that can be present in those who have experienced a traumatic event, such as war, kidnapping, rape, combat, and/or police work (Burgess & Holmstrom, 1974; Henry, 2004; Van der Kolk, 2013). According to Yehuda et. al., approximately 5-10% of people experience PTSD (2015). Similar to other mental disorders, PTSD can have both physiological and psychological symptoms. Physical symptoms of PTSD can include hyperarousal, exaggerated startle response, changes in appetite or sleep patterns, etc., while psychological symptoms can include extreme fear or helplessness and reliving the traumatic experience when triggered (Shalev et. al., 1998; Cross & Ashley, 2004). When it comes to experiencing the symptoms of PTSD, it is common for those afflicted to not have any symptoms until they are triggered by a person, place, or event that reminds them of the original trauma (Yehuda, 2002).

The two most common mental disorders developed after trauma are depression and post-traumatic stress disorder; as a result, the two disorders were often grouped into one overall issue rather than being separated. Because of this, multiple studies have focused on determining if the two are in fact one disorder or not, with results proving that they are independent disorders that share numerous symptoms (Shalev et. al., 1998; O'Donnell et. al., 2004).

Depression

Depression, which falls under a mood disorder, is another one of the most common mental disorders in the United States with approximately one in six people experiencing depression at some time in their lives (NIMH, 2018; Torres, 2020). Depression is generally described as persistent feelings of sadness and/or general disinterest in formerly pleasurable activities (Torres, 2020). Similar to anxiety, there are several forms of depressive disorders; however, most depressive disorders have the basic symptoms of feeling sad or depressed, lack of interest in pleasurable things, increased fatigue, disruption of sleep patterns, and inability to concentrate (NIMH, 2018). These symptoms can be detrimental and disrupt someone's day-to-day life. The various depressive disorders include major depressive disorder, postpartum depression, and bipolar disorder (NIMH, 2018). All of these depressive disorders are classified under mood disorders, as they are caused by a dysregulation of moods and mood swings. Depression has been known to cause suicidal ideations and completed suicide; as a result, it is one of the most deadly disorders (WHO, 2021).

The link between trauma and depression has been studied numerous times, with research agreeing that experiencing trauma increases the risk of developing a depressive disorder (Hill, 2003; Fowler, Allen, Oldham, & Frueh, 2013; Negele, Kaufhold, Kallenbach, & Leuzinger-Bohleber, 2015). It has also been found that going through a traumatic event can increase the severity of a pre-existing depressive disorder (Vitriol et al., 2014).

Traumatic Jobs

It is generally agreed that there are several extremely traumatic careers, such as police officers, firefighters, healthcare workers, and military (Barlow, 2011; Goodwall

Team, 2021; Sandhu, 2021). These people in these professions experience an inordinate amount of trauma as compared to other careers. Due to this fact, police officers, firefighters, EMTs, military, and healthcare workers tend to have higher instances of mental disorders, such as anxiety, depression, and post-traumatic stress disorder (Violanti & Patton, 1999; Pflanz, 2001; Henry, 2004; Cross & Ashley, 2004; Stanley, Hom, & Joiner, 2015; Kim et. al., 2018). There has been numerous accounts of research on the mental health of the people in these professions.

Police Officers

Police officers can have a very stressful job environment (Queiros et. al., 2020). As first responders, police officers witness some very traumatic events, including fatal accidents, being shot at, extreme child abuse, murders, suicides, and taking a life in the line of duty, among other tragedies (Henry, 2004). Each of these incidents can be classified as traumatic events, and police officers witness this on a daily basis. Repeated exposure to such distressing events can play a heavy role in the development of mental disorders. According to Alexander (1999), one such issue is the phenomenon referred to as burnout, which is a response to constant and repeated traumatic strain. Those experiencing burnout feel that they are failing at what they intended to do and that nothing they do matters. This feeling can often lead officers who are otherwise great at their jobs to quit because they can no longer handle the physical/emotional/mental stress that comes with their positions. Two other mental disorders faced by police officers are survivor's guilt and post-traumatic stress disorder (PTSD). Survivor's guilt, in this case, refers to an officer who has witnessed the death of a fellow officer while they managed to stay alive (Henry, 2004). This survivor's guilt can prelude or exacerbate other mental

disorders, as the mental health of an officer can take a huge blow in these situations. Post-traumatic stress disorder is another mental problem that officers can face after a particularly traumatic incident (Cross & Ashley, 2004). According to Javidi and Yaholladie (2012), the rate of PTSD in police officers ranged from 6-32%. Two more mental disorders common for police officers are depression and anxiety, with the study conducted by Tsehay, Necho, Gelaye, Beyene, and Birkie in 2021 finding that their sample size had a rate of depression of 28.9% and a rate of anxiety to be 30.2%. These are much higher than the general population average of 16.7% for depression and 19.1% for anxiety (NAMI, 2017; NIMH, 2018).

High amounts of trauma and stress can also affect a person physically. When the body experiences stress, an increase in cortisol occurs. Abnormally high levels of cortisol damage the neurons, leading to the damaging of the immune system in addition to several physical and behavioral problems (Solomon & Heide, 2005). The physical issues that can arise from abnormal stress responses can include migraines, appetite changes, sleeping pattern changes, and extreme fatigue; the behavioral problems that can arise include temperamental outbursts and substance abuse (Cross & Ashley, 2004). When an officer turns to substance abuse as an attempt to self-medicate, it can easily turn into an addiction. Addiction to alcohol or drugs can affect bodily organs, such as the liver and kidneys, amongst others (Varga et. al., 2017).

Military Personnel

Being a member of the military increases the chance of exposure to traumatic events, which in turn increases the chance of developing PTSD, anxiety disorders, and depressive disorders (Cornum, Matthews, & Seligman, 2011; Javidi & Yaholladie, 2012).

It is estimated that approximately 30% of military personnel return from deployment with a mental disorder (Xue et. al., 2015). According to McCauley et. al. (1995), roughly 15-20% of military personnel have symptoms of anxiety, depression, and PTSD. The study completed by Pflanz in 2001 surveyed 85 military patients at a mental hospital: 26% were being treated for depression, 9% were being treated for anxiety, and 3% were being treated for PTSD. The rates for anxiety and PTSD are lower than in most other studies; however, this could be due to the small sample size. In one research study, PTSD made up 25% of all cases across all branches of the military (Lovering, Proctor, & Heaton, 2013). Most of the research on the mental health of those in the military is based on the prevalence of PTSD. This could be attributed to both anxiety and depression being symptoms of PTSD (Price, Monson, Callahan, & Rodriguez, 2006).

Firefighters

Firefighters have a very stressful job, as they work as first responders, sometimes rushing into burning buildings to save lives (Torpey, 2016). With such a demanding career, it is expected that firefighters suffer from a variety of mental disorders. While the most commonly researched is post-traumatic stress disorder, firefighters are also known to suffer from both anxiety and depressive disorders as well (Wagner et. al., 2020).

Research on the prevalence of depressive disorders, specifically major depressive disorder, has found a rate of up to 33% in firefighters; likewise, the prevalence rate of anxiety disorders was found to be up to 19.4% (Boxer & Wild, 1993; Bryant & Guthrie, 2005 & 2006, Carleton, et. al., 2018). The rate for depressive disorders is much higher than the rate for the general population, with it being 16.7%, while the rate for anxiety

disorders is not much higher than the general population's rate of 19.1% (NAMI, 2017; NIMH, 2018).

There is more research on the development of post-traumatic stress disorder in firefighters. According to research, PTSD is the most common mental disorder in firefighters (Wagner et. al., 2020). However, it is interesting that various studies find different prevalence rates of PTSD in firefighters. The research completed by Chen et. al. (2007) found a rate of 10.5%, research completed by Kwon et. al. (2019) found a rate 13.7%, and Javidi and Yadollahie (2012) found a rate of 21%. These differences can be attributed to several factors, including sample size, geographical location, and/or methodological approaches. It is important to note that despite the variations between prevalence rates, all are above the general population's average prevalence rate for PTSD, which is 5-10% (Yehuda et. al., 2015).

EMTs

EMT stands for Emergency Medical Technicians and they are among the first responders to a scene. This means that they see a lot of the same trauma as police officers; as a result, they are susceptible to developing mental disorders (Stanley, Hom, & Joiner, 2016). EMTs are often put in life-or-death situations, in which they are responsible for another person's life. Consequently, they tend to have high rates of stress and burnout (Boudreaux & Mandry, 1996). One study on the prevalence of death anxiety in EMTs found that 46.7% of their sample size experienced severe death anxiety (Asadi, Esmaeilpour, Salmani, & Salmani, 2021). Unfortunately, the research on the mental health of EMTs is similar to that of firefighters, in that most of the research is on PTSD instead of other anxiety and depressive disorders. A study conducted by Clohessy and

Ehlers (1999) found that EMTs had a rate of 20% for PTSD. This is twice the rate for the general population's rate (Yehuda et. al., 2015). Likewise, Javidi and Yadollahie (2012) reported a prevalence rate of 21% for PTSD in EMTs.

Healthcare Workers

Healthcare workers can encompass a wide range of people, including doctors, nurses, and lab technicians. These workers are constantly in life-or-death situations, holding the lives of others in their hands and constantly witnessing human suffering. This constant stress lends itself to the development of several mental disorders, including anxiety, depression, and post-traumatic stress disorder, according to National Institute for Occupational Safety and Health (2019). Most of the research on the mental health of healthcare workers after 2019 is skewed by data from the COVID-19 pandemic, as the strain put upon the healthcare system caused a sharp uptick in instances of mental disorders in the workers (Mental Health America, 2020; Vizheh et. al., 2020). According to the study completed by Vizheh et. al. (2020), the highest reported rates of anxiety among healthcare workers was 67.55% and the highest reported rates of depression was 55.89%. Likewise, the research completed by Mental Health America in 2020 reported that 86.06% of the healthcare workers surveyed experienced anxiety. These numbers are more than three times the general population's rate of anxiety. Of the literature gathered here, these are the highest rates of both anxiety and depression reported. Post-traumatic stress disorder is also prevalent amongst healthcare workers. One study in Canada reported rates of PTSD as high as 40% (Institutes of Health, 2022). This is over four times the 5-10% prevalence rate for PTSD of the general population (Yehuda et. al.,

2015). Another study found that while only 18% had diagnoses of PTSD, 22% experienced symptoms of PTSD (Mealer et. al., 2009).

There is an abundance of research on trauma and its effects on the mental health of several professions, including police officers, military personnel, firefighters, EMTs, and healthcare workers. The majority of the research conducted agree that these professions have a high amount of trauma associated with them; as a result, those who work in these careers have higher instances of mental disorders. The most common mental disorders developed by those who experience trauma are anxiety disorders, depressive disorders, and post-traumatic stress disorder. There is a gap in the literature on the mental health of forensic scientists, who also experience a higher amount of trauma than the average person. According to the Bureau of Labor Statistics (2022), a forensic scientist is one who aids in criminal investigation through the collection and analyzation of evidence. This means that these forensic scientists are at the same crime scenes as other first responders, such as police officers and firefighters. With the marked increase in violent crime rate in the United States, it is safe to say that all first responders are witnessing more traumatic events than before (Lucas, 2021; MacFarquhar, 2021; Lopez, 2022). Based on prior research, it is expected that this study will produce results of high instances of mental health disorders in forensic scientists.

CHAPTER III: METHODOLOGY

Data

To complete this study, a survey was created using the program Qualtrics. Basic demographical questions were asked in order to determine if there was any correlation between certain demographics and the levels of mental disorders experienced. Simple questions regarding their careers and work experience, such as the total number of cases worked and total number of cases involving juveniles, were also asked to establish if there is any relationship between higher instances of mental disorders and high numbers of cases.

The questionnaires and scale used to measure anxiety, PTSD, and depression were taken from several different mental health surveys. The questions to determine anxiety were from the Anxiety Screen Questionnaire from Berkeley University. The measurement questions were taken almost exactly as they were listed by Berkeley, with only minor wording changes being made for clarity. The same evaluation questions were asked for a period going back both 2 weeks and 6 months. Answer choices were as follows: not at all, some of the time, most of the time, and all of the time. These answer choices were given a numerical equivalent of 0, 1, 2, and 3, respectively. The numerical value of the answer to each question was added up to determine the level of anxiety present. There were seven questions, meaning the highest score possible was a 21. The scale created measured 0-5 as little to no anxiety, 6-10 as mild anxiety, 11-15 as moderate anxiety, and 16+ as severe anxiety.

The questions used to measure PTSD were taken from the U.S. Department of Veteran Affairs. The questions were reworded for conciseness and clarity. There were

also some questions added, as it was determined the 5 questions taken from the VA were insufficient to measure PTSD. Each evaluation question was asked for a period going back both 2 weeks and 6 months. Answer choices were as follows: not at all, some of the time, most of the time, and all of the time. These answer choices were given a numerical equivalent of 0, 1, 2, and 3, respectively. The numerical value of the answer to each question was added up to determine the level of PTSD present. There were seven questions, meaning the highest score possible was a 21. The scale created measured 0-5 as little to no PTSD, 6-10 as mild PTSD, 11-15 as moderate PTSD, and 16+ as severe PTSD.

The questions used to determine depression were selected from the website QuestionPro. The questionnaire was slightly altered for the purpose of this research. For example, when measuring depression, questions regarding suicidal ideation were removed. They were removed as questions regarding suicide ideation or attempts are considered sensitive and were overall unnecessary for this research. The questions were asked for a period going back both 2 weeks and 6 months. Answer choices were as follows: not at all, some of the time, most of the time, and all of the time. These answer choices were given a numerical equivalent of 0, 1, 2, and 3, respectively. The numerical value of the answer to each question was added up to determine the level of depression present. There were ten questions, meaning the highest score possible was a 30. The scale created for depression was 0-7 as little to no depression, 8-14 as mild depression, 15-21 as moderate depression, and 22+ as severe depression.

Upon completion of the survey and approval by the Institutional Review Board, the data was distributed by the Mississippi Division of the Interational Association for

Identification (MDIAI). The full membership of the MDIAI were notified by email and were allowed the opportunity to complete the survey. The survey was open for a period of four weeks to allow as many responses as possible while remaining within time constraints.

Analytic Approach

This study originally intended to utilize both correlation tests and multiple regression; however, the limitations of the data required a scaling back of the initial statistical approach. Due to this, the analysis of the data focuses on an examination of both correlations between variables, as well as variations across the different types of forensic scientists who responded to the survey. Although such limitations inherently affect the results, the data is suggestive and helps to better outline both the types and severity of mental health disorders that forensic scientists may face in their careers. It can also illustrate what types of cases they may be exposed to that may contribute to the development or worsening of these mental health issues, as well as suggest future directions for research.

CHAPTER IV: RESULTS

Descriptives

In Table 1 shown below, information on some of the demographic questions asked in the survey can be seen. The average age of the respondents was 47.8 years old, with the youngest age reported as 25 years old and the oldest age as 74 years old. Years in the field averaged 15.5 years. The shortest amount of time working as a forensic scientist was 6 months, while the longest amount of time was 40 years. Responses to the numbers of cases worked had extremes, with the lowest number of cases reported as 28 and the highest number of cases as 10,000. This caused an average of 1649.4 total cases worked. The number of juvenile cases also had extremes, with a minimum value of 0 and a maximum value of 3000, causing an average of 383.1 juvenile cases.

Table 1: Sample Descriptives 1

Variable	N	Mean	Std. Dev.	Min.	Pctl. 25	Pctl. 75	Max
Age	36	47.772	12.612	25	40.25	55.75	74
Years in Field	38	15.5	10.075	0.5	8	22	40
Number of Cases Worked	32	1649.375	2544.464	28	350	1450	10,000
Juvenile Cases	35	383.086	679.27	0	17.5	375	3000

Table 2 below shows more demographic information, with the percentage of respondents shown for each variable. The percentage of those who described themselves as experiencing anxiety, depression, and PTSD are also reported. Almost 70% of the respondents were civilians, rather than sworn officers. 53.8% of the sample worked as locals, 43.6% were state employees, and only 2.6% were an employee of the federal government. When asked if they would describe themselves as experiencing anxiety, a combined 65.7% responded that they experience either major or minor anxiety. The results are similar for depression, in that a combined 53.1% responded with experiencing either major or minor depression. For PTSD, the majority, 65.6%, responded that they do not experience PTSD and 34.4% responded that they did.

Table 2: Demographic Descriptives

Variable	N	Percentage
Sworn or Civilian	39	
Civilian	27	69.20%
Sworn	12	30.80%
Agency Level	39	
Federal	1	2.60%
Local	21	53.80%
State	17	43.60%
Anxiety	35	
No	12	34.30%

Yes; major anxiety	7	20%
Yes; minor anxiety	16	45.70%
Depression	32	
No	15	46.90%
Yes; major depression	4	12.50%
Yes; minor depression	13	40.60%
PTSD	32	
No	21	65.60%
Yes; minor PTSD	11	34.40%

In Table 3 below, the various types of forensic scientist that responded to the survey are broken down into percentages. The highest number was Crime Scene Investigators, with 27.8% of respondents identifying themselves as such. The next highest was the general term Forensic Scientists, with 25%. Coroners made up 19.4% of respondents, and Medical Examiners were 8.3%. The rest of the types of forensic scientists were 2.8% each, indicating each had one person identify themselves with that title.

Table 3: Title Descriptives

Variable	N	Percentile
<i>Title</i>	36	
Coroner	7	19.40%
Crime Scene Investigator	10	27.80%
	31	

Detective	1	2.80%
Forensic Anthropologist	1	2.80%
Forensic Biologist	1	2.80%
Forensic Scientist	9	25%
Latent Print Examiner	1	2.80%
Medical Examiner	3	8.30%
Medicolegal Investigator	1	2.80%
Retired	1	2.80%
Supervisory Physical Scientist	1	2.80%

In Figure 1 below, a distribution of the total number of cases worked by the respondents can be seen. As shown in Table 1, the lowest number of cases was 28 and the highest number of cases was 10,000. The graph shows that while there was a significant spread of the number of cases worked, the majority of respondents worked less than 2500 cases total.

Figure 1: Distribution of Cases Worked

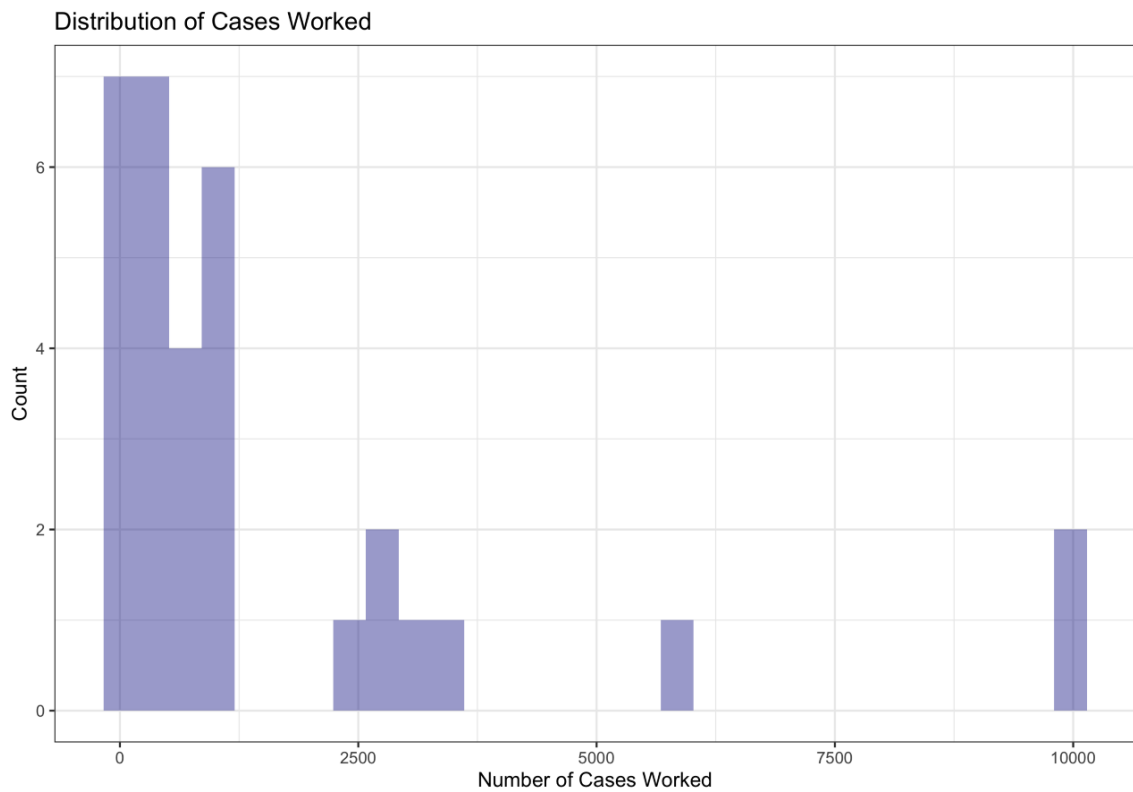


Figure 2 below demonstrates the spread of cases involving juveniles that were reported by the survey respondents. Table 1 showed that the minimum amount was 0 cases and the maximum amount was 3000 cases. Similar to the total number of cases worked, there is a significant spread across the amount of juvenile cases worked. Likewise, the majority of respondents worked less than 1000 cases that involved juveniles.

Figure 2: Distribution of Juvenile Cases

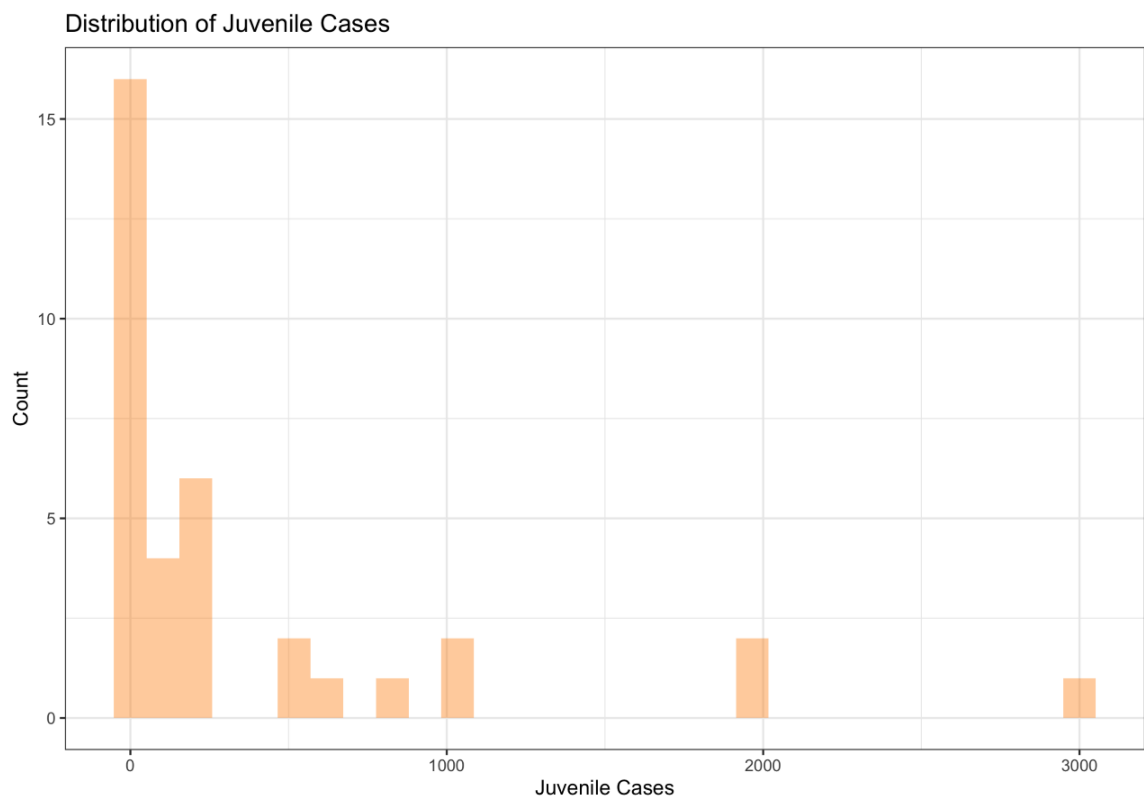
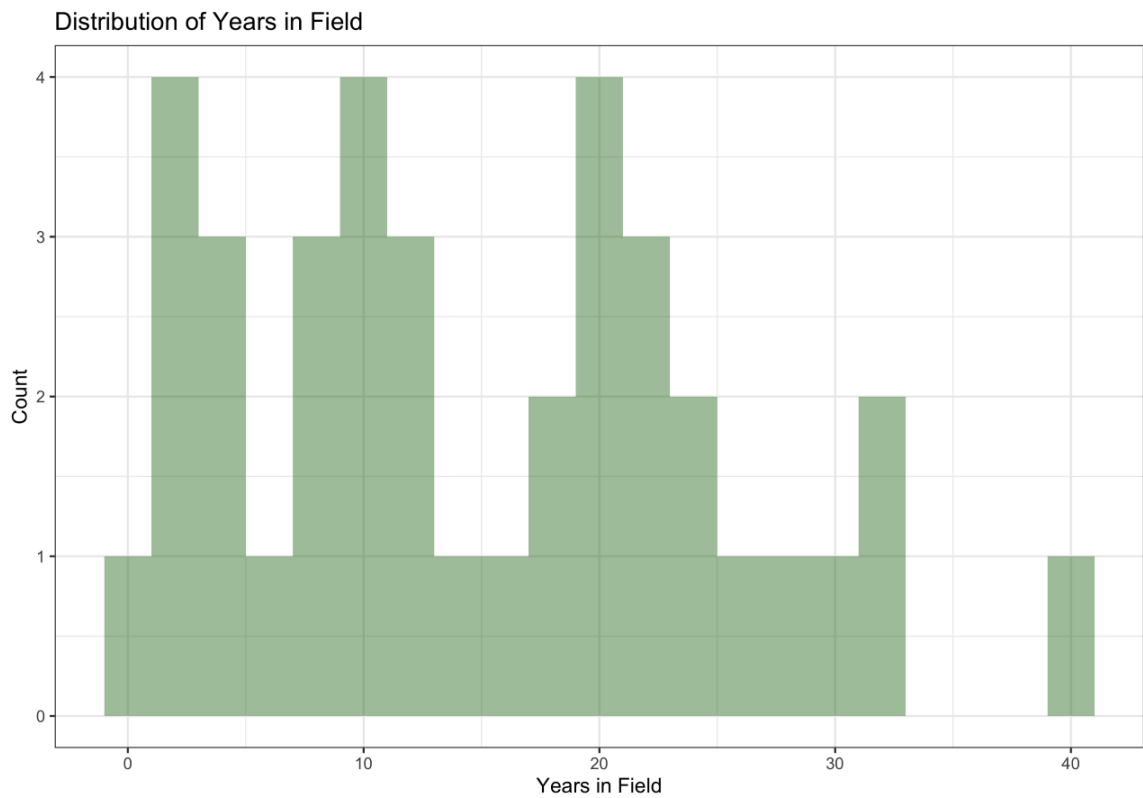


Figure 3 below displays the number of years in the field by the survey respondents. As Table 1 reported, the lowest amount was 6 months and the highest amount of years was 40 years. The data spread across this graph is not as varied as previous figures, as the minimum and maximum are much closer. Most of the responses hover in a middling area, between 10 and 30 years of service.

Figure 3: Distribution of Years in the Field



Mental Health

Table 4 below shows the correlation of responses between “2 week anxiety,” “2 week PTSD,” “6 month anxiety,” and “6 month PTSD¹.” As this is a correlation table, the 1’s in the table mean there is a perfect relationship between responses. The correlation between “2 week anxiety” and “6 month anxiety” is 0.93, or 93%. This means that responses to “2 week anxiety” and “6 month anxiety” vary together 93% of the time. 0.82 “2 week anxiety” also varied with “2 week PTSD,” and 0.85 varied with “6 month PTSD.” “6 month anxiety” and “2 week PTSD” have a 0.74 correlation, which is the lowest in the table; likewise, “6 month anxiety” and “6 month PTSD” have a 0.78 correlation. The highest correlation in the table, besides the perfect correlations, is between “2 week PTSD” and “6 month PTSD,” with 0.99.

Table 4: Correlation Between Anxiety and PTSD

	2 week anxiety	6 month anxiety	2 week PTSD	6 month PTSD
2 week anxiety	1.00	0.93	0.82	0.85
6 month anxiety	0.93	1.00	0.74	0.78
2 week PTSD	0.82	0.74	1.00	0.99
6 month PTSD	0.85	0.78	0.99	1.00

¹ The information on depression was not available due to an error in the survey.

In Figure 4 below, the levels of anxiety reported are presented. The anxiety questionnaires were assigned a numerical scale to determine level. The lowest a person could score was a 0 and the highest was a 21. As shown on the graph, the majority of responses are in the lower levels, with a small amount of “6 month anxiety” at the higher range; however, nobody scored a 0, meaning every respondent reported some level of anxiety. The graph also validates the data in Table 4, in that those who experience “2 week anxiety” are likely to experience “6 month anxiety” as well.

Figure 4: Anxiety Levels

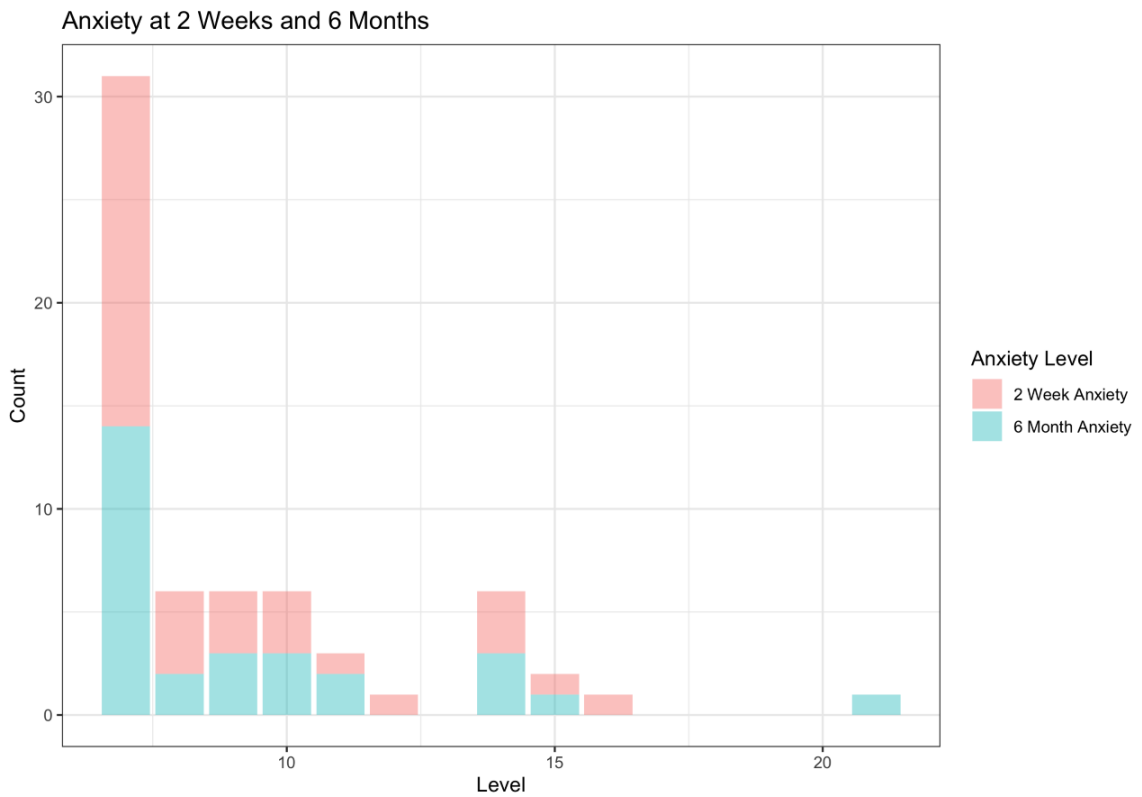
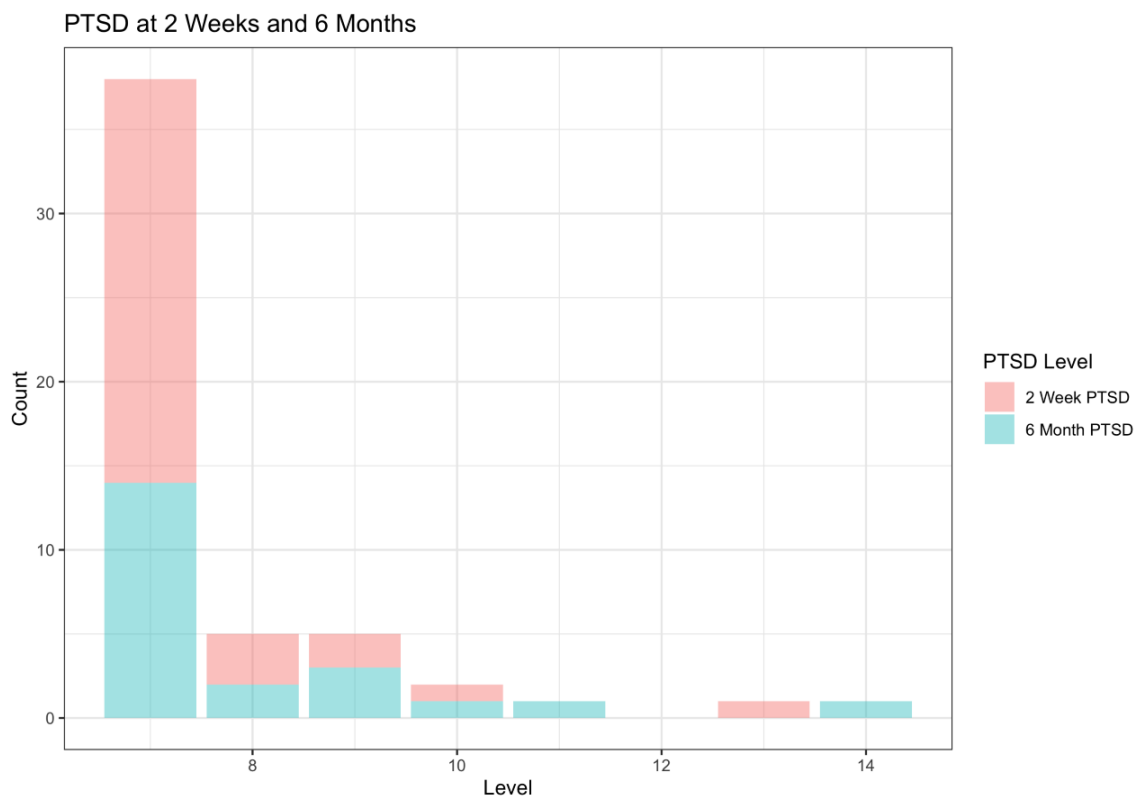


Figure 5 below shows the levels of PTSD reported by the sample. The PTSD questionnaire was assigned a numerical scale to determine levels. The lowest possible score was a 0 and the highest was a 21. As evidenced by the graph, the majority of responses were in the lower levels; however, nobody scored a 0, meaning all respondents experienced some level of PTSD. Figure 5 also validates the data in Table 4 by demonstrating the correlation between “2 week PTSD” and “6 month PTSD.”

Figure 5: PTSD Levels



Difference Across Jobs

Table 5 below illustrates the variations across the different types of forensic scientists who responded to the survey. Across the board, the levels of anxiety and depression are high, with no reported score under 7. This result indicates that no one in the sample reported no anxiety or PTSD. The overall highest levels were reported by the detective, with a 14 in both “2 week anxiety” and “6 month anxiety”; however, the detective did not have the highest numbers in PTSD. The forensic anthropologist scored a 10 in “2 week PTSD” and an 11 in “6 month PTSD.” According to these data, there is no correlation between the number of juvenile cases and levels of anxiety and PTSD.²

Table 5: Levels of Anxiety and PTSD Across Various Jobs

Title	N	Average Years in Field	Average Cases Worked	Average Juvenile Cases	2 Week Anxiety	6 Month Anxiety	2 Week PTSD	6 Month PTSD
Coroner	7	13.71	859.4	64	7.17	7	7	7
Crime Scene Investigator	10	16.1	2791.88	384.78	8.1	8.25	7.56	7.62
Detective	1	32	1000	200	14	14	8	9
Forensic Anthropologist	1	6	50	10	10	10	10	11
Forensic Biologist	1	16	1000	200	N/A	N/A	N/A	N/A

² The author attempted correlation tests on the relevant variables (e.g. years in the field and anxiety/PTSD) but none of the tests were significant. This is likely due to the low response rate, and the related low levels of statistical power.

Forensic Scientist	9	16.31	1681.33	1183.33	9.88	9.57	7	7
Latent Print Examiner	1	15	3000	500	8	8	7	N/A
Medical Examiner	3	9.33	760	136.67	10.33	10	9.33	9.67
Medicolegal Investigator	1	0.5	130	2	8	11	7	7
Retired	1	20	1100	800	N/A	N/A	N/A	N/A
Supervisory Physical Scientist	1	20	6000	10	7	7	7	N/A
No Title Given	24	21.33	500	88.33	11.5	15	7	8.5

CHAPTER V: DISCUSSION AND CONCLUSION

The correlations noted in Table 4 likely occur because many mental health disorders occur together, rather than individually. This indicates that the adjusted measures used in the current analysis to determine the levels of anxiety and PTSD have at least face validity, as previous literature states that most mental health disorders occur together (Davis Behavioral Health, 2020). The high levels of correlation may also be due to the fact that PTSD falls under the category of an anxiety disorder; therefore, those who experience PTSD also experience symptoms commonly associated with anxiety (Arroll & Kendrick, 2018). Although the current sample is small, the findings regarding anxiety and PTSD presented above may indicate that most forensic scientists will experience higher levels of mental health disorders because of the trauma they experience in their work. The levels of anxiety and PTSD reported are much higher than the general population's which means that the original hypothesis of this research may be correct in that forensic scientists experience the same issues as other first responders because they are exposed to similar trauma, though the effects were not significant because of the small sample size.

Within the current analysis, there appears to be no correlation between the number of cases worked and the levels of anxiety and/or PTSD experienced. An example of this is the forensic anthropologist, who had an average of 50 cases but scored a 10 and above in 2 week and 6 month anxiety and PTSD; meanwhile, the crime scene investigators averaged of 2791.8 cases but did not score above an 8.5 in any category of anxiety or PTSD. This may be due to the single forensic anthropologist being an anxious person while the combined crime scene investigators do not experience as much anxiety

and/or PTSD. The lack of a correlation between caseload and mental health disorder levels could also be due to the types of cases worked and trauma experienced. Previous research does not differentiate between the types of cases worked by other first responders, such as the police officers or firefighters. In the current analysis, the forensic anthropologist might have been subject to a particularly traumatic case, while the crime scene investigators may have had cases with less severity. Interestingly, within the current findings, the detective had the highest total levels of anxiety and PTSD, which aligns with previous research on police officers having higher rates of these mental health disorders (Cross & Ashley, 2004; NAMI, 2017; NIMH, 2018).

Despite the effects of trauma found within this analysis, a negative correlation between the number of years in the field and “6 month anxiety” levels was found in the data from this study.³ This may be due to a few different factors. Perhaps those with longer careers have developed better coping mechanisms, leading to lower levels of mental health disorders. It may also be self-selection within the profession, as people who could not handle the trauma related to their jobs quit after a shorter period of time than those who remain. However, the negative correlation could also be due to the small sample size allowing an outlier with a large number of years in the field and very low anxiety to skew the results.

Research Challenges

As with all research, there are challenges to approaching the topic of mental health and forensic science. Specifically, questions asked in this survey were of a very sensitive nature, and the topic of mental health and mental illnesses is often taboo. This

³ This correlation was not significant on testing, but approached significance ($p < .10$).

can mean that many people struggle to answer those questions and be completely truthful. As mentioned in the methodology section above, the questionnaire measuring depression was altered to remove questions on suicidal ideation, demonstrating the sensitivity and delicacy of questions related to medical information. There may also be professional concerns of the respondents, even though the survey was anonymous. They may not want their superiors or their organization to know the extent of their mental health disorders so as to not miss out on any opportunities that may arise. Respondents may also be attempting to avoid admitting any issue coming from their jobs, or they may be avoiding any peers doubting their competency and ability.

Limitations

The primary limitation in the current study was the small sample size, which lowered the statistical power and made it difficult to detect any meaningful differences within the data. While there were 43 responses, only 21 answered every question, leading to issues when statistical analyses were attempted. This is in part due to the difficulty in finding organizations willing to send out the survey, with only the MDIAI agreeing. The reason only MDIAI agreed may be because the author is a Mississippi-based resident; other divisions may have felt that an undergraduate thesis from an out-of-state student was not an appropriate item to send to their membership. Yet another limitation that affected the data was the fact that the depression questionnaire in the survey failed, meaning it did not show up for the respondents to answer. It is unclear why this error occurred.

Future Research

Future research should focus on expanding the sample size and re-addressing the questions this study attempted to answer. Based on the data that is present, it is entirely possible that further relationships between the variables exist; however, they simply could not be detected with the small sample. Research completed in the future should also differentiate between the types of trauma experienced across types of respondent, such as a forensic scientist who specializes in terrorist attacks versus one who only works simple crime scenes.

Over 65% of forensic scientists surveyed in this analysis responded that they would describe themselves as having either major or minor anxiety, which is much higher than the general population's rate of 19.1% (NAMI, 2017). Likewise, a combined 53.1% reported experiencing depression, over three times the 16.7% of the general population (NIMH, 2018; Torres, 2020). Finally, 34.4% responded as experiencing PTSD; again, this is much higher than the rate of PTSD in the general population, which is 5-10% (Yehuda et. al., 2015). These results demonstrate why the research completed in this study is so important. With forensics being the one of the fastest growing careers, it is vital that those going into the field know what they might be facing in their futures (BLS, 2020). Closing this gap in the literature will begin that process.

APPENDIX A: IRB APPROVAL LETTER

Office of
Research Integrity



118 COLLEGE DRIVE #5116 • HATTIESBURG, MS | 601.266.6756 | WWW.USM.EDU/ORI

NOTICE OF INSTITUTIONAL REVIEW BOARD ACTION

The project below has been reviewed by The University of Southern Mississippi Institutional Review Board in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services regulations (45 CFR Part 46), and University Policy to ensure:

- The risks to subjects are minimized and reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered involving risks to subjects must be reported immediately. Problems should be reported to ORI via the Incident submission on InfoEd IRB.
- The period of approval is twelve months. An application for renewal must be submitted for projects exceeding twelve months.

PROTOCOL NUMBER: 21-104
PROJECT TITLE: The Effects of Trauma on the Mental Health of Forensic Scientists
SCHOOL/PROGRAM Criminal Justice, Forensic, Science
RESEARCHERS: PI: Carley Sistrunk
Investigators: Sistrunk, Carley-Hill, Joshua B.~
IRB COMMITTEE ACTION: Approved
CATEGORY: Expedited Category
PERIOD OF APPROVAL: 07-Feb-2022 to 06-Feb-2023

A handwritten signature in cursive script that reads "Donald Sacco".

Donald Sacco, Ph.D.
Institutional Review Board Chairperson

APPENDIX B: EFFECTS OF TRAUMA SURVEY

Effects of Trauma

Start of Block: Block 5

Q24

Welcome to the research study!

We are interested in understanding the effect of trauma on the mental health of forensic scientists. You will be presented with information relevant to the career and mental health and asked to answer some questions about it. Please be assured that your responses will be kept completely confidential. No personal information will be stored in data retention, and only the principal investigator will have access to the survey responses on a password-protected computer in the possession of the investigator at all times. Once the study is complete, the results will be deleted from all storage.

The potential risks and/or discomforts included in this study are possible triggers and/or emotional discomfort, as some of the questions asked are in regards to sensitive trauma and mental health information. If you experience any distress due to this, please exit the survey and contact a local mental health provider, the National Suicide Prevention Hotline (800-273-8255), or SAMHSA's National Helpline (1-800-662-4357).

The benefit of participating in this study is contribution to new research. It will help researchers further understand the effect work-related trauma has on mental health.

The study should take you around 45 minutes to complete. Your participation in this research is voluntary. You have the right to withdraw at any point during the study, for any reason, and without any prejudice. If you would like to contact the Principal Investigator in the study to discuss this research, please e-mail Carley Sistrunk at carley.sistrunk@usm.edu, or you may contact the IRB Chair at 601-266-5997.

By clicking the button below, you acknowledge that your participation in the study is voluntary, you are 18 years of age, and that you are aware of the risks included and that you may choose to terminate your participation in the study at any time and for any reason.

Please note that this survey will be best displayed on a laptop or desktop computer. Some

features may be less compatible for use on a mobile device.

- I consent, begin the study (1)
- I do not consent, I do not wish to participate (2)

Skip To: End of Survey If Welcome to the research study! We are interested in understanding the effect of trauma on the... = I do not consent, I do not wish to participate

End of Block: Block 5

Start of Block: Default Question Block

Q1 Age: [Numerical answer only]

Q15 Gender:

- Male (1)
- Female (2)
- Non-binary / third gender (3)
- Prefer not to say (4)

Q2 Official title of position:

Q19 Is your position sworn or civilian?

- Sworn (1)
- Civilian (2)

Q20 What is your current agency level?

- Local (1)
- State (2)
- Federal (3)

Q3 Number of years in the field: [Numerical answer only]

Q4 Approximate total number of cases worked: [Numerical answer only]

Q5 Approximate total number of cases that involved juveniles: [Numerical answer only]

Q7 What was the manner of the case(s) involving juveniles? [Choose all that apply.]

- Homicide (1)
 - Suicide (2)
 - Kidnapping (3)
 - Rape (4)
 - Sexual Battery (5)
 - Mass crimes (mass shootings/spree killings/serial crimes) (6)
 - Child abuse/neglect (7)
-

Q8 Have you ever sought professional assistance for a mental disorder, specifically anxiety, depression, or post-traumatic stress disorder (PTSD)? [Choose all that apply.]

- Yes; anxiety (1)
 - Yes; depression (2)
 - Yes; PTSD (3)
 - No (4)
-

Display This Question:

If Have you ever sought professional assistance for a mental disorder, specifically anxiety, depress... = Yes; anxiety

Or Have you ever sought professional assistance for a mental disorder, specifically anxiety, depress... = Yes; depression

Or Have you ever sought professional assistance for a mental disorder, specifically anxiety, depress... = Yes; PTSD

Q14 Did you seek professional assistance for depression, anxiety, and/or PTSD before or after you began working in your current position?

Before (1)

After (2)

End of Block: Default Question Block

Start of Block: Measuring Anxiety

Q9 Over the past 2 weeks, how often have you experienced:

Please choose most applicable answer.

	Not at All (1)	Some of the time (2)	Most of time (3)	All of the time (4)
Feeling nervous, anxious, or on edge (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Not being able to stop or control worrying (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Worrying too much about things out of your control (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trouble relaxing (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Being so restless that it is hard to sit still (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Becoming easily annoyed or irritable (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feeling afraid as if something awful might happen (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Display This Question:
 If Over the past 2 weeks, how often have you experienced: : Please choose most applicable answer.
 = Some of the time
 Or Over the past 2 weeks, how often have you experienced: : Please choose most applicable answer. = Most of time
 Or Over the past 2 weeks, how often have you experienced: : Please choose most applicable answer. = All of the time

Q16 Over the past 6 months, how often have you experienced:

Please choose most applicable answer.

	Not at All (1)	Some of the time (2)	Most of time (3)	All of the time (4)
Feeling nervous, anxious, or on edge (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Not being able to stop or control worrying (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Worrying too much about things out of your control (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trouble relaxing (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Being so restless that it is hard to sit still (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Becoming easily annoyed or irritable (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feeling afraid as if something awful might happen (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q11 Would you describe yourself as having anxiety?

- Yes; minor anxiety (1)
- Yes; major anxiety (2)
- No (3)

End of Block: Measuring Anxiety

Start of Block: Measuring Depression

Q10 In the past 2 weeks, how often have you experienced:

Please choose the most applicable answer.

	Not at All (1)	Some of the time (2)	Most of the time (3)	All of the time (4)
--	----------------	----------------------	----------------------	---------------------

A lack of concentration (14)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Problems making decisions (15)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
No interest in things that used to interest you (16)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feeling irritated/agitated (17)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feeling fatigued (18)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feeling like a failure (19)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sleeping too much/Not sleeping enough (20)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Loss of appetite (21)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trouble in your relationships (22)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feeling sad, down, or depressed (23)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Display This Question:

If In the past 2 weeks, how often have you experienced: : Please choose the most applicable answer. = Some of the time

Or In the past 2 weeks, how often have you experienced: : Please choose the most applicable answer. = Most of the time

Or In the past 2 weeks, how often have you experienced: : Please choose the most applicable answer. = All of the time

Q17 In the past 6 months, how often have you experienced:

Please choose the most applicable answer.

	Not at All (1)	Some of the time (2)	Most of the time (3)	All of the time (4)
A lack of concentration (12)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Problems making decisions (13)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
No interest in things that used to interest you (14)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feeling irritated/agitated (15)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feeling fatigued (16)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feeling like a failure (17)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sleeping too much/Not sleeping enough (18)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Loss of appetite (19)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trouble in your relationships (20)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Feeling sad, down, or depressed (21)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q12 Would you describe yourself as having depression?

- Yes; minor depression (1)
- Yes; major depression (2)
- No (3)

End of Block: Measuring Depression

Start of Block: Measuring Post-Traumatic Stress Disorder

Q24 The following questionnaire asks questions regarding traumatic experiences in order to measure post-traumatic stress disorder. If you feel uncomfortable answering these types of questions, please choose the "skip" option. If you feel comfortable in proceeding, please choose the "continue" option.

- Skip (1)
- Continue (2)

Skip To: End of Block If The following questionnaire asks questions regarding traumatic experiences in order to measure po... = Skip

Skip To: Q14 If The following questionnaire asks questions regarding traumatic experiences in order to measure po... = Continue

Q14 In the past 2 weeks, how often have you experienced:

The term "event(s)" refers to the case(s) involving juveniles

	Not at All (1)	Some of the time (2)	Most of the time (3)	All of the time (4)
--	----------------	----------------------	----------------------	---------------------

<p>Having nightmares about the event(s) (1)</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<p>Having thoughts about the event(s) when you did not want to (2)</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<p>Trying hard to not think about the event(s) or purposefully avoiding situations that reminded you of the event(s) (3)</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<p>Being constantly on guard, watchful, or easily startled (4)</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<p>Feeling numb or detached from people, activities, and/or surroundings (5)</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<p>A feeling of guilt regarding the event(s) and the circumstances surrounding it (6)</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<p>Bodily reactions (sweating, nausea, dizziness, heart racing, etc) when reminded of the event(s) (7)</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Display This Question:

If In the past 2 weeks, how often have you experienced: : The term "event(s)" refers to the case(s) involving juveniles = Some of the time

Or In the past 2 weeks, how often have you experienced: : The term "event(s)" refers to the case(s) involving juveniles = Most of the time

Or In the past 2 weeks, how often have you experienced: : The term "event(s)" refers to the case(s) involving juveniles = All of the time

Q18 In the past 6 months, how often have you experienced:

The term "event(s)" refers to the case(s) involving juveniles

	Not at All (1)	Some of the time (2)	Most of the time (3)	All of the time (4)
--	----------------	----------------------	----------------------	---------------------

<p>Having nightmares about the event(s) (1)</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<p>Having thoughts about the event(s) when you did not want to (2)</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<p>Trying hard to not think about the event(s) or purposefully avoiding situations that reminded you of the event(s) (3)</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<p>Being constantly on guard, watchful, or easily startled (4)</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<p>Feeling numb or detached from people, activities, and/or surroundings (5)</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<p>A feeling of guilt regarding the event(s) and the circumstances surrounding it (6)</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<p>Bodily reactions (sweating, nausea, dizziness, heart racing, etc) when reminded of the event(s) (7)</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q14 Would you describe yourself as having post-traumatic stress disorder?

- Yes; minor PTSD (1)
- Yes; major PTSD (2)
- No (3)

End of Block: Measuring Post-Traumatic Stress Disorder

Start of Block: Mental Health Resources

Q21 Does your current employer offer resources for mental health?

- Yes (1)
- Unsure (2)
- No (3)
- Probably not (4)

Display This Question:

If Does your current employer offer resources for mental health? = Yes

Q22 Have you utilized these resources?

- Yes (1)
- No (2)

End of Block: Mental Health Resources

REFERENCES

- Akiskal, H. S. (1998). Toward a definition of generalized anxiety disorder as an anxious temperament type. *Acta Psychiatrica Scandinavica*, 98, 66-73.
- Alexander, C. (1999). Police psychological burnout and trauma. *Police trauma: Psychological aftermath of civilian combat*, 54-64.
- American Psychological Association. (2020). Anxiety disorders. Retrieved from <https://www.psychiatry.org/patients-families/anxiety-disorders>
- Arroll, B., & Kendrick, T. (2018). Definition of Anxiety. *Primary Care Mental Health*, 20, 125-37.
- Asadi, N., Esmaeilipour, H., Salmani, F., & Salmani, M. (2021). The relationship between death anxiety and alexithymia in emergency medical technicians. *OMEGA – Journal of Death and Dying*. doi: <https://doi.org/10.1177/00302228211053475>
- Ayazi, T., Lien, L., Eide, A., Swartz, L., & Hauff, E. (2014). Association between exposure to traumatic events and anxiety disorders in a post-conflict setting: a cross-sectional community study in South Sudan. *BMC psychiatry*, 14(6). <https://doi.org/10.1186/1471-244X-14-6>
- Barlow, T. (2011). What are the most stressful occupations? *Forbes Magazine*. Retrieved from <https://www.forbes.com/sites/tombarlow/2011/04/26/what-are-the-most-stressful-occupations/?sh=4ed05e101dc5>

- Boudreaux, E. & Mandry, C. (1996). Sources of stress among emergency medical technicians (Part I): What does the research say? *Prehosp Disaster Med*, *11*(4), 296–301.
- Bremner, J. D. (1999). The lasting effects of psychological trauma on memory and the hippocampus. *Law and Psychiatry*.
- Breslau, N., Peterson, E. L., & Schultz, L. R. (2008). A second look at prior trauma and the posttraumatic stress disorder effects of subsequent trauma. *Arch Gen Psychiatry*, *65*(4). doi:10.1001/archpsyc.65.4.431
- Bryant, R. A. & Guthrie, R. M. (2005). Maladaptive appraisals as a risk factor for posttraumatic stress: a study of trainee firefighters. *Psychol Sci*, *16*, 749-752. <http://dx.doi.org/10.1111/j.1467-9280.2005.01608.x> [CrossRefGoogle ScholarPubMed](#)
- (2006). Extinction learning before trauma and subsequent posttraumatic stress. *Psychosom Med*, *68*, 307–311.
doi: 10.1097/01.psy.0000208629.67653.cc [CrossRefGoogle ScholarPubMed](#)
- Bureau of Labor Statistics. (2020). Occupational outlook handbook: Forensic science technicians. <https://www.bls.gov/ooh/life-physical-and-social-science/forensic-science-technicians.htm#:~:text=in%20May%202020,-.Job%20Outlook,the%20average%20for%20all%20occupations>.
- Burgess, A. W., & Holmstrom, L. L. (1974). Rape trauma syndrome. *The American Journal of Psychiatry*, *131*(9), 981–986.

- Carleton, R. N., Afifi, T. O., & Turner, S., et al. (2018). Mental disorder symptoms among public safety personnel in Canada. *Can J Psychiatry*, *63*, 54-64.
doi: 10.1177/0706743717723825 [CrossRefGoogle ScholarPubMed](#)
- Chen, Y. S., Chen, M. C., Choi, F., Sun, F. C., Chen, P. C., Tsai, K. Y., & Chao, S. S. (2007). The relationship between quality of life and posttraumatic stress disorder or major depression for firefighters in Kaosiung, Taiwan. *Quality of Life Research*, *16*, 1289-1297.
- Chesen, J. (2008). The CSI effect – theres no such things as questions, just hidden answers. *Its Evident*. NCSTL.
- Clohessy, S. & Ehlers, A. (1999) PTSD symptoms, response to intrusive memories and coping in ambulance service workers. *Br J Clin Psychol*, *38*(3), 251–65
- Cornum, R., Matthews, M. D., & Seligman, M. E. P. (2011). Comprehensive Soldier Fitness: Building resilience in a challenging institutional context. *American Psychologist*, *66*(1), 4–9. <https://doi.org/10.1037/a0021420>
- Cross, C. L., & Ashley, L. (2004). Police trauma and addiction: Coping with the dangers of the job. *FBI L. Enforcement Bull.*, *73*, 24.
- Davis Behavioral Health. (2020). The 5 most common mental disorders. Retrieved from <https://www.dbhutih.org/the-5-most-common-mental-disorders/>
- Federal Bureau of Investigation. (2020). Crime data explorer. Retrieved from <https://crime-data-explorer.app.cloud.gov/pages/explorer/crime/crime-trend>

- Fowler, J. C., Allen, J. G., Oldham, J. M., & Frueh, B. C. (2013). Exposure to interpersonal trauma, attachment insecurity, and depression severity. *Journal of Affective Disorders, 149*(1-3), 313-318.
- Goodwall Team. (2021). Here are 14 of the most stressful jobs that are not for the faint of heart. Retrieved from <https://www.goodwall.io/blog/most-stressful-jobs/>
- Henry, V. E. (2004). *Death work: Police, trauma, and the psychology of survival*. Oxford University Press.
- Hill, J. (2003). Childhood trauma and depression. *Current Opinion in Psychiatry, 16*(1), 3-6.
- Javidi, H. & Yadollahie, M. (2012). Post-traumatic stress disorder. *International Journal of Occupational and Environmental Medicine, 3*(1), 2-9.
- Kessler, R. C., McLaughlin, K. A., Green, J. G., et al. (2010). Childhood adversities and adult psychopathology in the WHO world mental health surveys. *British Journal of Psychiatry, 197*(378-385).
- Khoury, L., Tang, Y. L., Bradley, B., Cubells, J. F., & Ressler, K. J. (2010). Substance use, childhood traumatic experience, and posttraumatic stress disorder in an urban civilian population. *Depress Anxiety, 27*(12). doi: [10.1002/da.20751](https://doi.org/10.1002/da.20751)
- Kim, J. E., Dager, S. R., Jeong, H. S., Ma, J., Park, S., Kim, J., Choi, Y., Lee, S. L., Kang, I., Ha, E., Cho, H. B., Kim, E. J., Yoon, S., & Lyoo, I. K. (2018). Firefighters, posttraumatic stress disorder, and barriers to treatment: Results from a nationwide total population survey. *PLoS ONE, 13*(1). doi: <https://doi.org/10.1371/journal.pone.0190630>

- Kleber R. J. (2019). Trauma and Public Mental Health: A Focused Review. *Frontiers in psychiatry*, 10, 451. <https://doi.org/10.3389/fpsyt.2019.00451>
- Kwon, S. C., Song, J., Lee, S. J., Koh, J., Ryou, H., Kim, S. H., Kim, D., & Jung, S. A. (2019). Posttraumatic stress symptoms and related factors in firefighters of a firestation. *Korean Journal of Occupational and Environmental Medicine*, 20(3), 193-204. doi: <https://doi.org/10.25271/kjoem.2008.20.3.193>
- Lopez, G. (2022). Police and the alternatives. *New York Times*. Retrieved from <https://www.nytimes.com/2022/03/06/briefing/crime-solutions-ukraine-war-books.html#:~:text=The%20country's%20murder%20rate%20last,be%20a%20pandemic%2Dinduced%20blip>.
- Lovering, M. E., Proctor, S. P., & Heaton, K. J. (2013). A retrospective study of anxiety disorder diagnoses in the military from 2000 to 2009. *Journal of Anxiety Disorders*, 27(1), 25-32.
- Lucas, R. (2021). FBI data shows an unprecedented spike in murders nationwide in 2020. *National Public Radio*. Retrieved from https://www.google.com/search?q=what+does+npr+stand+for&rlz=1C1UEAD_enUS945US945&oq=what+does+npr+stand+for&aqs=chrome.0.0i512110.3888j1j9&sourceid=chrome&ie=UTF-8
- MacFarquhar, N. (2021). Murders spiked in 2020 in cities across the United States. *New York Times*. Retrieved from <https://www.nytimes.com/2021/09/27/us/fbi-murders-2020-cities.html>

McCauley J., Kern D. E., Kolodner K., Dill L., Schroeder A. F., DeChant H. K. et. al.

(1995). The “battering syndrome”: prevalence and clinical characteristics of domestic violence in primary care internal medicine practices. *Ann Intern Med*, 123(10), 737–746

Mealer, M., Burnham, E. L., Goode, C. J., Rothbaum, B., & Moss, M. (2009). The prevalence and impact of post traumatic stress disorder and burnout syndrome in nurses. *Depress Anxiety*, 26(12), 1118-1126

Mental Health America. (2020). The mental health of healthcare workers in COVID-19. Retrieved from <https://mhanational.org/mental-health-healthcare-workers-covid-19>

National Alliance on Mental Illness. (2017). Anxiety disorders. Retrieved from <https://www.nami.org/About-Mental-Illness/Mental-Health-Conditions/Anxiety-Disorders#:~:text=Over%2040%20million%20adults%20in,develop%20symptoms%20before%20age%2021.>

National Institute of Mental Health (NIMH). (2020). Mental illness. Retrieved from <https://www.nimh.nih.gov/health/statistics/mental-illness#:~:text=Mental%20illnesses%20are%20common%20in,mild%20to%20moderate%20to%20severe.>

(2022). Anxiety disorders. Retrieved from <https://www.nimh.nih.gov/health/topics/anxiety-disorders>

(2018). Depression. Retrieved from

<https://www.nimh.nih.gov/health/topics/depression>

National Institute of Occupational Safety and Health. (2019). Healthcare workers: Work stress and mental health. *Centers for Disease Control and Prevention*. Retrieved from <https://www.cdc.gov/niosh/topics/healthcare/workstress.html>

Negele, A., Kaufhold, J., Kallenbach, L., & Leuzinger-Bohleber, M. (2015). Childhood trauma and its relation to chronic depression in adulthood. *Depression Research and Treatment*. doi: [10.1155/2015/650804](https://doi.org/10.1155/2015/650804)

O'Donnell, M. L., Creamer, M., & Pattison, P. (2004). Posttraumatic stress disorder and depression following trauma: understanding comorbidity. *American Journal of Psychiatry*, *161*(8), 1390-1396.

Office on Women's Health (OASH). (2019). Anxiety disorders. *U.S. Department of Health and Human Services*. Retrieved from <https://www.womenshealth.gov/mental-health/mental-health-conditions/anxiety-disorders>

Pflanz, S. (2001). Occupational stress and psychiatric illness in the military: Investigation of the relationship between occupational stress and mental illness among military mental health patients. *Military Medicine*, *166*(6), 457-462.

Podlas, K. (2005). The CSI effect: Exposing the media myth. *Fordham Intell. Prop. Media & Ent. LJ*, *16*, 429.

- Potter, G. (2013). The history of policing in the United States, part 1. Eastern Kentucky University. Retrieved from <https://ekuonline.eku.edu/blog/police-studies/the-history-of-policing-in-the-united-states-part-1/>
- Price, J. L., Monson, C. M., Callahan, K., & Rodriguez, B. F. (2006). The role of emotional functioning in military-related PTSD and its treatment. *Journal of Anxiety Disorders, 20*(5), 661-674
- Queiros, C., Passos, F., Bartolo, A., Marques, A. J., Fernandes de Silva, C., & Pereira, A. (2020). Burnout and stress measurement in police officers: Literature review and a study with the operational police stress questionnaire. *Frontiers in Psychology*. <https://doi.org/10.3389/fpsyg.2020.00587>
- Rinne-Albers, Mirjam A. W.; van der Wee, Nic J. A.; Lamers-Winkelmann, Francien; Vermeiren, Robert R. J. M. *European Child & Adolescent Psychiatry*. Dec2013, Vol. 22 Issue 12, p745-755. 11p. 1 Color Photograph, 2 Charts. DOI: 10.1007/s00787-013-0410-1.
- Roane, K. R. & Morrison, D. (2005). The CSI effect. *US News and World Report, 138*(15), 48-54.
- Rosenberg, L. (2011). Addressing trauma in the mental health and substance use treatment. *The Journal of Behavioral Health Services & Research, 38*(428).
- Saks, M. J., Schweitzer, N. J. (2007). The CSI effect: Popular fiction about forensic science affects public expectations about real forensic science. *Jurimetrics, 47*. 357-364.

- Sandhu, M. (2021). 12 most stressful jobs according to research. *Freedom from Addiction*. Retrieved from <https://www.freedomaddiction.ca/blog/most-stressful-jobs/>
- Shalev, A. Y., Freedman, S., Peri, T., Brandes, D., Sahar, T., Orr, S. P., & Pitman, R. K. (1998). Prospective study of posttraumatic stress disorder and depression following trauma. *American Journal of psychiatry*, *155*(5), 630-637.
- Solomon, E. P., & Heide, K. M. (2005). The Biology of Trauma: Implications for Treatment. *Journal of Interpersonal Violence*, *20*(1), 51–60. <https://doi.org/10.1177/0886260504268119>
- Stanley, I. H., Hom, M. A., & Joiner, T. E. (2015). A systematic review of suicidal thoughts and behaviors of police officers, firefighters, EMTs, and paramedics. *Clinical Psychology Review*, *44*, 25-44. doi: <https://doi.org/10.1016/j.cpr.2015.12.002>
- Substance Abuse and Mental Health Services Administration (SAMHSA). (2014). Trauma-informed care in behavioural health services. *Treatment Improvement Protocol Series*, *57*.
- Torpey, E. (2016). Adrenaline jobs: High-intensity careers. *Bureau of Labor Statistics*. Retrieved from <https://www.bls.gov/careeroutlook/2016/article/adrenaline-jobs.htm>
- Torres, F. (2020). What is depression? *American Psychiatric Association*. Retrieved from <https://www.psychiatry.org/patients-families/depression/what-is-depression>

- Tsehay, M., Necho, M., Gelaye, H., Beyene, A., & Birkie, M. (2021). Generalized anxiety disorder, depressive symptoms, and sleep problem during COVID-19 outbreak in Ethiopia among police officers: A cross-sectional survey. *Frontier Psychology, 9*. <https://doi.org/10.3389/fpsyg.2021.713954>
- Van Der Kolk, B. A. (2013). The biological response to psychic trauma. *Post-Traumatic Therapy And Victims Of Violence, 25*.
- Varga, Z. V., Matyas, C., Paloczi, J., & Pacher, P. (2017). Alcohol misuse and kidney injury: Epidemiological evidence and potential mechanisms. *Alcohol research: Current reviews, 38*(2), 283-288.
- Violanti, J. M., & Paton, D. (1999). *Police trauma: Psychological aftermath of civilian combat*. Charles C Thomas Publisher.
- Vitriol, V., Cancino, A., Weil, K., Salgado, C., Asenjo, M. A., & Potthoff, S. (2014). Depression and psychological trauma: An overview integrating current research and specific evidence of studies in the treatment of depression in public mental health services in Chile. *Depression Research and Treatment*.
doi: [10.1155/2014/608671](https://doi.org/10.1155/2014/608671)
- Vizheh, M., Qorbani, M., Arzaghi, S. M., Muhidin, S., Javanmard, Z., & Esmaili, M. (2020). The mental health of healthcare workers in the COVID-19 pandemic: A systematic review. *Journal of Diabetes & Metabolic Disorders, 19*, 1967-1978.
- Williams, N. (2021). What is emotional dysregulation? *News Medical – Life Sciences*. Retrieved from <https://www.news-medical.net/health/What-is-Emotional-Dysregulation.aspx>

World Health Organization (WHO). (2001). The world health report 2001: Mental disorders affect one in four people. *World Health Organization*. Retrieved from <https://www.who.int/news/item/28-09-2001-the-world-health-report-2001-mental-disorders-affect-one-in-four-people#:~:text=One%20in%20four%20people%20in,ill%2Dhealth%20and%20diability%20worldwide.>

(2021). Depression. Retrieved from <https://www.who.int/news-room/factsheets/detail/depression>

Yehuda, R. (2002). Post-traumatic stress disorder. *New England Journal of Medicine*, 346, 108-114. DOI: 10.1056/NEJMra012941

Yehuda, R., Hoge, C. W., McFarlane, A. C., Vermetten, E., Lanius, R. A., Nievergelt, C. M., Hobfoll, S. E., Koenen, K. C., Neylan, T. C., & Hyman, S. E. (2015). Post-traumatic stress disorder. *Nature Reviews Disease Primers*, 1(15057)