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Meta-Analysis of the Effectiveness Magnitude of Hypnosis on Posttraumatic Stress Disorder Treatment

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Abstract

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MA, Walden University, 2014

MS, University of Mining and Geology, 1997

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Abstract

The increased intensity of modern life and the experiences in combat situations has brought on enormous stress and has led many individuals to develop posttraumatic stress disorder (PTSD). Hypnosis is one of the treatment methods available to professionals and has been proven to provide fast, reliable results in multiple studies. Despite these results, the lack of understanding of the physiological effects of hypnosis on the brain has prevented its use as a common treatment method for PTSD. By examining the differences between the effectiveness of hypnosis in military and civilian populations, the aim of this meta-analysis was to isolate the ideal personal characteristics and causes of the trauma that make hypnosis an effective treatment. The first 2 research questions compared the mean effect sizes and their ranges between the 2 populations and extracted the personality characteristics that would make treatment of PTSD by hypnosis successful based on the comparison itself and analysis of the populations from the currently available research and the biases in the studies. The final research question was aimed at comparing the success of cognitive behavioral therapy (CBT) in combination with hypnosis and the duration of the treatment method. The analyses based on the quantitative results led to the conclusion that military personnel experience a higher successful rate of treatment for PTSD through hypnotherapy combined with CBT. This suggests that hypnotherapy can be recommended for individuals who have respect toward authority and schedules. The provided guidelines were intended to increase the popularity of hypnosis, and if implemented, will produce positive social change because more people will be able to find faster, more reliable relief from PTSD, improving not only the patient's quality of life but also the quality of life of those around him.

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Table of Contents

List of Tables

List of Figures

Chapter 1: Introduction to the Study

Introduction

Posttraumatic stress disorder (PTSD) is a problem for many people. The condition can occur for many people at once due to wars, disasters, or terrorist situations. Immediately after the stressful situation that causes the symptoms of PTSD to emerge, many believe that the symptoms will go away with time; however, even when the initial symptoms disappear, the experience, memory, and pain remain and affect the person's behavior, relationships, and self-acceptance (Qi, Gevonden, and Shalev, 2016). People experiencing PTSD need professional help; however, because the treatment takes time, can lead to addictions as in a case of medications, or the person has to visit a specialist, many prefer to stay away from professionals and self-medicate with drugs and alcohol (McDevitt-Murphy, Luciano, Tripp, & Eddinger, 2017). For a short moment, this solution can take the individual away from the problem, but in the long term, it will destroy their health and their personal and social life. There are many examples of people who came back from military deployment and found themselves unable to share conversations with the people who they were previously closest to. For the veteran returning from service, a person who even a short while ago was seen as loving, patient, and provided easy discourse, can evoke anger and hatred with each word. For married couples, this often leads to separation or divorce; although, sometimes the other partner can understand the problem and ask for help (Eads & Wark, 2015).

There are a variety of treatments available for PTSD. Currently, the most popular tool is cognitive behavioral therapy (CBT) in combination with medications. However,

this treatment takes time, and some of the medications can lead to addiction (Qi, Gevonden, and Shalev, 2016). Another suitable tool is hypnosis, which usually works faster, without the potential for addiction, and can be used in combination with other methods. Hypnosis can be applied in a passive, relaxed state with the patient's eyes closed or in an active state in which the client can perform a task to occupy their full concentration (Wark, 2016).

Background

The rapid increase in the number of people with PTSD requires faster and more effective treatment measures. The problems and suffering of those with PTSD not only impact the particular individuals because we live in a society with a steady, fast flow of communication and their agony can directly or indirectly influence many members of their social group. The faster that help can be provided to the person experiencing PTSD, the faster that they can return to being a productive member of society and a positive influence on the people in their community. Hypnosis is one of the tools that could make faster treatments a reality, but as everything else, this form of therapy will help only if it has an application. Over the years, hypnosis has been applied in the treatment of PTSD and has had effective results in many cases (Wickramasekera, 2015a). In order to make hypnosis a more commonly-used practice, the effectiveness must be better understood.

Problem Statement

Although hypnosis and PTSD have been known for a long time in modern psychology, the practice of hypnosis has not been a popular treatment for PTSD. As hypnosis has the potential to provide faster results, it should become a tool available to both clients and professionals and should be assessed along with other treatment options for each individual to determine the optimum method of reducing their suffering. Hypnosis is one of the tools that could accelerate the effectiveness of the treatment of PTSD and help many families return to happiness faster. In order to provide hypnosis as a potential tool for psychologists, the mysticism around it must be eliminated and its effectiveness proven. There have been many studies conducted within the last several years demonstrating that effectiveness (Abramowitz & Lichtenberg, 2010); however, hypnosis remains unused potentially because it is difficult to determine the best situations and candidates for the treatment.

Purpose of the Study

The purpose of this study was to investigate the use of hypnosis in the treatment of PTSD by providing an outline of the characteristics of the ideal candidates for the treatment. The treatment could be applied in combination with other techniques or using only hypnosis. The study was a meta-analysis which combined the data from many prior studies. Because hypnosis has been proven as a successful treatment method for both civilian and military personnel, the study explored the differences in effectiveness and attempted to identify the characteristics most applicable to the treatment method.

Research Questions and Hypotheses

This study answered the following research questions and hypotheses:

RQ1: What are the ranges of effect sizes, including 95% confidence intervals, for hypnosis as a treatment for deployed personnel and civilians suffering from PTSD?

$H_0$1: The range of the effect size, including 95% confidence intervals, for hypnosis as a treatment for deployed personnel and civilians is below 0.20.

H_A1: The range of the effect size, including 95% confidence intervals, for hypnosis as a treatment for deployed personnel and civilians is more than 0.20.

RQ2: What are the overall mean effect sizes, including 95% confidence intervals, for hypnosis as a treatment for deployed personnel and civilians suffering from PTSD?

$H_0$2: The overall mean effect sizes, including 95% confidence intervals, for hypnosis as a treatment for deployed personnel and civilians is below 0.50.

H_A2: The overall mean effect sizes, including 95% confidence intervals, for hypnosis as a treatment for deployed personnel and civilians is more than 0.50.

RQ3: Do the effect sizes differ from the overall mean effect size based on moderator variables such as whether hypnosis was used in combination with a cognitive behavioral therapy or the duration of the therapy?

$H_0$3: The range of and overall mean effect sizes including 95% confidence intervals, for hypnosis as a treatment for deployed personnel and civilians are below 0.20.

H_A3: The range of and overall mean effect sizes including 95% confidence intervals, for hypnosis as a treatment for deployed personnel and civilians are above 0.20.

Conceptual Framework

The symptoms of PTSD have been known for a long time under different names (Reisman, 2016; Zoladz & Diamond, 2016). Even with modern psychology practices, people continue to suffer, and some prefer self-medication with alcohol and drugs rather than seeking a professional (McDevitt-Murphy, et al., 2017; Wilson et al., 2017). Scientists, together with practitioners, continue to work to find new treatment approaches, of which, probably the most used in the practice today is CBT combined with medication. However, CBT sometimes takes a long time and the medications have side effects and the potential for addiction (Qi, Gevonden, & Shalev, 2016). An alternative to all these treatments could be hypnosis because it is a natural process, but it remains unused because it could not be scientifically tested with the previously available technology (Wickramasekera, 2015 b). This meta-analysis attempted to reach a better understanding of the effects of hypnosis on PTSD.

The modern practice of hypnosis was greatly advanced by George H. Estabrooks (1963), Milton Erickson (Auld, 2008), and Dave Elman (2012), who developed their methods through personal practices, observations, and Central Intelligence Agency (CIA) experiments. As the number of people experiencing PTSD has increased with modern wars, such as those in Iraq and Afghanistan, there has been a renewed interest in hypnosis both in military and civilian populations. While research has been conducted on either population with modern technologies (Barabasz & Barabasz, 2015; Masson, Bernoussi, & Regourd-Laizeau, 2016), no clear consensus has been reached on its application. This treatment method can bring a faster solution to many military and civilian people with PTSD symptoms and provide relief to the people around them.

Nature of the Study

The study was organized as a meta-analysis regarding the magnitude of the effect of hypnosis on the treatment of PTSD, and it included research materials from 1963 to 2018. These materials included peer-reviewed articles and dissertations because they gave a broader perspective while maintaining the integrity of the source material. These sources were retrieved from electronic databases such as ProQuest, PsycINFO, Medline, and Google Scholar. The search terms used to find source material were *hypnosis, hypnotherapy, PTSD, treatment, alternative treatment,* as well as different combinations of the aforementioned terms. Articles were marked for inclusion into the quantitative analysis portion of this study based on the age group of the populations involved, psychological disorder discussed, and the number of subjects used in the experiments or case studies. For example, studies with children and adolescents were excluded. In

addition, to be included in the quantitative analysis, the materials had to present enough information to be determine the effect size.

After determining the source material, the Mantel-Haenszel statistical test was the underlying statistical test for the quantitative analysis portion of the meta-analysis. This method will be described in full detail in Chapter 3, but as a summary, the test reduces the results of each of the source studies into a table of simple results. Each simple result is a sum of the instances that an event was experienced. For example, one of the results was the total number of instances for which a military personnel member was successfully treated by hypnosis, while another result in the table was whether a civilian member was unsuccessfully treated by hypnosis (Deeks & Higgins, 2010). Therefore, the independent variable for this meta-analysis was whether the subjects are civilians or military personnel, and the dependent variable was whether they were successfully treated for PTSD using hypnosis. All of this data were provided to the statistical analysis package, RevMan5, because it not only provided an accurate quantitative analysis but also allowed for the development of a bias control structure.

Definitions of Terms

Alcohol use disorder (AUD): A disorder in which the consumption of alcohol is unregulated and uncontrolled (American Psychiatric Association, 2013).

Cognitive behavior therapy (CBT): A type of psychotherapy that helps people to overcome mental disorders through the modification of dysfunctional behaviors and thoughts (APA, 2013).

Confidence intervals: The percentage certainty that the desired effect is an element of a population (i.e., a 99% confidence interval means that a researcher is 99% certain that, for example, a successful treatment of hypnosis can be found in the population); (Gravetter & Wallnau, 2009).

Dependent variable: Shows the level of success of the treatment based on different applications of the independent variable (e.g., the level of success in the treatment of PTSD using hypnosis); (Card, 2012).

Diagnostic and Statistical Manual of Mental Disorders (*DSM)*: A published manual by the APA (2013) that offers a common set of definitions and criteria used in the diagnosis of psychological disorders.

Effect size: A statistical quantitative score that is used for comparing two groups that have different sample sizes by taking the difference between the standardized mean of an experimental group and the standardized mean of the control group (Coe, 2002).

Heterogeneity test statistic: A quantitative descriptor of the variation in the outcomes of a select number of studies (Deeks & Higgins, 2010).

Hetero-hypnosis: The practice of hypnosis in which one individual is in a relaxed state while another guides them through the process (Dell, 2017).

Hypnosis: The APA presented the following definition: “a state of consciousness involving focused attention and reduced peripheral awareness characterized by an enhanced capacity for response to suggestion” (Lynn et al., 2015, p. 390).

Independent variable: This describes the different applications that are being modified by the experiment to produce an effect on the dependent variable (e.g., the

number of people civilian and military personnel who will be used in the experiment to determine whether they were successfully treated by hypnosis); (Card, 2012).

Irritable bowel syndrome (IBS): A dysfunction of the gastrointestinal tract whose reasons for development are unknown (Shahbazi, Solati, & Hasanpour-Dehkordi, 2016).

Mantel-Haenszel statistical test: The quantitative statistical test used by RevMan5 for analyzing the results from the source studies in meta-analyses. It relies on dividing the results of the meta-analysis into a simple table of binary values (Deeks & Higgins, 2010).

Meta-analysis: The statistical analysis of results of scientific studies. The number of the studies is not defined, and it depends on the research question and the available materials. It could unite two studies or hundreds of studies (Card, 2012).

Moderator variables: – A third set of variables, outside of the independent and dependent set, that can influence the outcomes presented in the dependent variable (Card, 2012).

Neuro-linguistic programming (NLP): The practice of inducing a state of heightened suggestibility through common conversational practices (Grimley, 2016).

Odds ratio (OR): The probability of an event occurring under the exposure of the dependent variable over the probability of the event happening without the exposure of the dependent variable (Deeks & Higgins, 2010).

Posttraumatic stress disorder (PTSD): A mental disorder that appears after an extreme experience or witnessing of violence which results in a variety of symptoms including depression and the inability of an individual to clearly control their emotions (APA, 2013).

Psychopharmacology: The use of professionally prescribed medication for the treatment of psychological disorders (Qi, et al., 2016).

RevMan5: A statistical software package used for the computation of the quantitative portion of a meta-analysis (Deeks & Higgins, 2010).

Self-hypnosis: The practice of hypnosis in a manner in which the individual undergoing the therapy puts themselves in the relaxed state and guides themselves through the process (Dell, 2017).

Substance use disorder (SUD): The uncontrolled use of substances in quantities exceeding those which are considered healthy for the human body (APA, 2013).

Scope of Delimitations

The study was based on materials published in English. Most of the materials were found electronically through the Walden Library and Google Scholar. The source materials were further narrowed down through the qualifiers listed earlier in the chapter, such as the minimum number of subjects who participated and the availability of quantitative statistics to determine the effective size.

Limitations

The primary limitations of this study existed from the nature of the meta-analysis itself. As the meta-analysis relies on the work of other researchers, any bias or limited information in their work was reflected in the results of this meta-analysis. Because this meta-analysis was conducted by a single person, the inclusion and exclusion criteria were interpreted only by a single individual, and their application might have been different if a group of people reviewed it. Finally, the study excluded specific populations, such

children and adolescents, from this study because their symptoms and processing are different than that of adults.

Significance

Hypnosis is a treatment method that has been known for a number of years; however, due to the lack of technological advances that would enable researchers to determine the physiological effects on the brain, it has not emerged as a primary method for the treatment of PTSD even though it has demonstrated itself to be a fast-acting and addiction-free method (Wickramasekera, 2015 b). The purpose of this study and its significance originated from the attempt to specify the characteristics and circumstances in which hypnosis is the most applicable and reliable treatment of PTSD. It attempted to complete this by comparing two different populations: civilians and military personnel. Military personnel experience a deeper impact from the traumatic event, while civilians experience a large disturbance on a rarer occurrence. The personalities of members of the military are also cultivated to be more similar and display more obedience toward authority, while civilians have a much wider range in personalities (Eads & Wark, 2015). By specifying the personality traits and the circumstances of the source of the trauma that are ideally treated by hypnosis, it may become a more widely-used method for the treatment of PTSD.

The results from this study could provide a greater a range of treatments that have the potential to produce results at a faster rate and without the adverse effects of addiction. This would not only expand the number of tools available to professionals but could also prevent many clients and patients from long, drawn out therapies with few

short-term results. The study aimed to contribute to positive social change by providing a faster treatment to people suffering from PTSD, which could potentially present them with the opportunity for a better quality of life.

Summary

The practices involved in the treatment of PTSD with hypnosis have been developed alongside the development of society in one form or another. The modern treatment of PTSD has relied more on treatment methods that can be physiologically understood by modern medical technologies; however, this has led to hypnosis becoming a less used practice, even for situations in which it could be considered the ideal treatment. The study intended to remedy the lack of the use of hypnosis by examining the characteristics and circumstances most suitable to the application of hypnosis as a treatment method through a quantitative analysis of the available research on adult populations of civilians and military personnel. Chapter 2 will provide a more thorough representation of the available research on the effectiveness of hypnosis as a treatment method and more specifically as a treatment method for PTSD.

Chapter 2: Literature Review

Introduction

Hypnosis has been used for a long time to treat a variety of disorders; however, only recently has it become a viable method for widespread use for the treatment of PTSD. Hypnosis is a treatment that allows an individual to be put under a state of heightened suggestibility and relaxation by a therapist. In this state, the therapist can help the individual gain an understanding of the source of a problem and guide them to a better perspective of their future. There has been a multitude of studies regarding the treatment of PTSD in military personnel as well as in civilian populations. Specifically, researchers have found that individuals with a military background are more easily put in a hypnotic trance (Eads & Wark, 2015). Similarly, research has been conducted into the success of hypnosis in treating civilians who have overcome sexual, emotional, or physical abuse, either using hypnosis by itself or in combination with other treatment methods (Wickramasekera, 2017). The meta-analysis attempted to bridge the gap between the effectiveness of the treatment of PTSD in a military-based population versus a civilian-based one. Specifically, it attempted to understand the difference in the treatment characteristics based on the source of the trauma and the differences in the characteristics of the participants. The results of this study will hopefully aid in developing a better understanding of the treatment and the characteristics that lead to more effective improvements in the lives of people with PTSD.

Literature Search Strategy

Multiple databases were used to search for qualifying studies; these databases included PsycINFO, MEDLINE, SocINDEX, EBSCOhost, Google Scholar, ProQuest, and Academic Search Complete. The database searches included the following keyword terms: *hypnosis, hypnotherapy, PTSD, treatment, alternative treatment,* and different combinations of the aforementioned terms. The literature review resources spanned publication dates from 1963 to 2018. Most of the materials used were peer-reviewed articles, but additional sources, including dissertations and books, were used to supplement the research literature to develop a clearer and fuller analysis.

Conceptual Framework

The symptoms of PTSD have been known for a long time (Reisman, 2016; Zoladz & Diamond, 2016). Many people continue to suffer from PTSD and desperately need help; for many, this desperation may cause them to turn to illegal drugs and alcohol (McDevitt-Murphy et al., 2017; Wilson et al., 2017).

Over the years, researchers and practitioners have identified different methods of treating people with PTSD, but these treatments have usually taken a great deal of time. The most common approach currently in use is CBT combined with psychopharmacology. However, sometimes CBT takes longer than the patients expect or, in the case of medications, the side effects cause another set of symptoms, such as addiction (Qi et al., 2016).

An alternative treatment method is hypnosis. Hypnosis is a natural process that remains relatively unused because it has not been easily testable using scientific methods

with the technologies previously available (Wickramasekera, 2015 b). Among the most notable researchers in the field of hypnosis are George H. Estabrooks (1963), Milton Erickson (Auld, 2008), and Dave Elman (2012). Each of them was a pioneer in establishing the modern methods of treatment using hypnosis. Estabrooks was involved in experiments using hypnosis among, other methods, during his time in the CIA and continued the experiments in his research work as a university professor. Erickson had polio, and the accompanying paralysis provided the circumstances from which to better observe the people around him. The researcher went on to employ these observations in his treatment practices (Auld, 2008). Elman first practiced stage hypnosis but then discovered that hypnosis could also be applied to help people who experience physical or emotional discomfort. He taught physicians, mental health professionals, and other medical staff common practical applications of hypnosis as a means to improve the experience of their patients (Elman, 2012).

The stress of war, such as that experienced in Iraq and Afghanistan, have caused many people to develop PTSD. This experience is especially true for military personnel, which has also led to an increased need for faster treatment approaches that have greater variety. Many scientists have used new technology to explore hypnosis for a better understanding of its functionality (Barabasz & Barabasz, 2015; Masson et al., 2016). Research continues to be conducted in an attempt to understand the relationship between military personnel with PTSD and civilians with PTSD. Combining the knowledge acquired from research in military-related PTSD and civilian-based PTSD studies would provide a greater and more diverse pool of treatment options for everyone suffering from

PTSD. This meta-analysis attempted to combine the applications from extant research. Examining every possible treatment method and assessing it for the ability to improve the quality of life for the individuals who suffer from PTSD could lead to widening the scope of treatment options and bringing about positive social changes. The ability to provide a better quality of life by using more effective treatments with a reduced risk of side effects will not only help threat one person suffering from PTSD but also the people around them because PTSD, as many other mental illnesses, impacts not only the person suffering from the direct symptoms but also the people around them.

Even a cursory examination of the available research of hypnosis as a method of treatment provides a significant number of studies that have addressed civilian and military populations. The effectiveness of hypnosis differs between the two groups based on different experiences and environments. For example, military personnel who have been treated using hypnosis often are found to be able to enter a hypnotic state with greater ease and will often reach faster results (Eads & Wark, 2015). The meta-analysis explored the differences in the methods of implementing hypnosis, the characteristics of the participants, and the research results between the two groups to evaluate the various factors impacting treatment effectiveness.

Literature Review

Posttraumatic Stress Disorder (PTSD)

Stress can be a stimulus for a person, but it can also be the cause of many emotional and physical disorders. PTSD symptoms have been described in the literature since 490 BC in ancient Greece (Reisman, 2016) and the 1st century BC in the Roman

Empire (Zoladz & Diamond, 2016). In the contemporary world, this particular set of symptoms has been given a variety of names. Throughout the Civil War, it was referred to as *soldier's heart* (Zoladz & Diamond, 2016) or *Da Costa's syndrome* (Reisman, 2016). During World War I, it was called *shell shock*, and during World War II, it was *battle fatigue*. Later, it was called *Vietnam syndrome*. In 1980, when the *Diagnostic and Statistical Manual of Mental Disorders – Third Edition* (*DSM-3*) emerged, it was diagnosed as posttraumatic stress disorder (Zoladz & Diamond, 2016). The *Diagnostic and Statistical Manual of Mental Disorders – Fifth Edition* (*DSM-5*) defines the stressors for PTSD as the direct exposure to or witnessing of a traumatic event or the indirect exposure to or learning about the event including working with body parts, looking at related pictures, or media of the event. There is yet another group of people who experience a similar set of stressors through games, news, and movies (APA, 2013).

Many people have PTSD and may either not know or not want to seek professional help. Military personnel are particularly unaware of or resistant to treatment; over 90% of them know that help is available, but most will attempt to manage by themselves. Others believe that if they seek professional help, they will face disapproval from their colleagues and friends (Halford, 2016). Although only 10% of the American population has had military experience, many of those who have had such experience have PTSD. While some may experience symptoms, they are not significant enough for PTSD treatment. The literature defines different thresholds for the variety of subtypes of PTSD, and the results can vary vastly depending on which version of the *DSM* is used for the assessment (Bergman, Przeworski, & Feeny, 2017). The problem becomes even

greater when military personnel who were deployed in combat return home and rejoin their significant others. Most of the individuals with PTSD have problems with communication, and it often impacts their relationships. They may refuse to talk, and when they do, it is usually a sharp and unpleasant conversation. Affectionate behaviors become rare, and the significant others are often confronted with the anger of the returning veteran. Additionally, many veterans with PTSD are involved in an increasing number of car accidents or socially unacceptable behavior as they try to rejoin civilian society (Fredman et al., 2017).

An exploration of practitioners' methodology in the treatment of PTSD shows that the various treatment methods share some common principles:

- Psychoeducation: It introduces the patient to the concept and roots of the PTSD in addition to offering some techniques for the management of associated distress.
- Coping skills and emotional regulation: Both are a part of a widely applied principle of treatment and, in some programs, they are a core of the program.
- Imaginal exposure: This tool and its functional mechanisms can be found in many treatment handbooks.
- Cognitive processing: This approach, which incorporates the making and restructuring of human thoughts, is well-described in literature. The most important part of the treatment is the development of a cognitive methodology for processing and interpreting meaning.

- Emotions: This treatment focus reemphasizes the significance of the regulation of emotions and the need to understand the process of getting emotions under control.
- Memory process: The functional mechanisms of memory and its influence on the human personality and sometimes constitute the most influential part of therapeutic work (Schnyder et al., 2015).

Each of these six principles is an important component of the major direction for work in the field of PTSD (Schnyder et al., 2015).

People with PTSD often attempt to cope with the symptoms with alcohol and thereby develop AUD. The severity of alcohol use is significantly higher for people who have PTSD (Wilson et al., 2017). In addition, people with AUD delude themselves into believing that they are in control of their drinking and do not believe that the alcohol abuse is a problem. Uncontrolled alcohol consumption along with possible flashbacks from the PTSD may negatively impact their social, personal, or intimate connections (Wilson et al., 2017). The problem of alcohol use has an even stronger association with military personnel; approximately 36% of military personnel have PTSD and, for many of them, it is combined with AUD and substance use disorder (SUD) (McDevitt-Murphy et al., 2017). Denial and self-medication are companion behaviors. For many, these disorders and behaviors are the only way they have found to deal with the associated anxiety, depression, and other symptoms such as nightmares. Other examples of PTSD associated destructive behaviors include self-mutilation, self-harm, and suicide (McDevitt-Murphy et al., 2017). As for nonmilitary patients experiencing PTSD, the

causes are often traced back to a very young age and from a family member or the family atmosphere itself (Salerno, 2005).

Modern medicine has produced several primary ways of treating people with PTSD. Perhaps the most popular currently are CBT and psychopharmacology (Qi et al., 2016). The former of these is a short-term, goal-oriented approach to treatment in which the therapist works with a client to redefine the negative thoughts, images, or beliefs related to a traumatic experience and shape a more positive, healthy attitude. Psychopharmacology may also produce fast results, but it can also often have negative impacts due to the medication's side effects or addictions (Qi et al., 2016).

PTSD has a variety of subtypes; one of these is dissociative which presents in individuals who have experienced direct exposure to the initial trauma. These individuals are good candidates for hypnosis treatment because they have heightened hypnotic suggestibility. Through the understanding of the type of PTSD and its source, a therapist can determine the most effective treatment method (Terhune & Cardena, 2015). Another lesser-used method of treatment for PTSD and dissociative disorder is sumboldrama, which uses guided imagery to help the patient reveal suppressed memories from the source of the trauma (Nilsson & Wadsby, 2010). Such treatments are based on visualization and imagery. The therapist allows the patient to enter a relaxed state and then guides him to a peaceful image. From there, the therapist slowly guides the patient to mentally recreate situations increasingly similar to the trauma and drives the patient into developing a healthy way to deal with the presented mental situation. Due to the connection between the mental images and the source of the PTSD, understanding how

the patient can handle the situation even after the fact can help develop a healthier everyday lifestyle (Nilsson & Wadsby, 2010).

Hypnosis

Franz Mesmer was among the first pioneers of hypnosis in modern practice. His belief was that human power comes from an animal magnetism and that a therapist can transfer his personal power to the patient. His work from the late 18th century would eventually lead to the modern practice of hypnosis. The origin of the word itself comes from the Greek word for sleep, Hypnos, ὑπνος, (Loubser, 2016; Shahbazi, et al., 2016). The 20th-century scientific society greatly advanced the practices and understanding of hypnosis through the work of three men who had vastly different approaches: George H. Estabrooks (1963), Milton Erickson (Auld, 2008), and Dave Elman (2012). In the late 20th century, John Grinder expanded the practice and methods of hypnosis by introducing neuro-linguistic programming (NLP). While previous methods of hypnosis relied on the client to enter the relaxed state under their own volition, NLP uses a form of hypnotic induction, which focuses on influencing target individuals without their direct intention. The practices developed through this method significantly expanded the tools that are available for therapists attempting to treat people with even severe cases of PTSD (Grimley, 2016).

Hypnosis itself is a natural process, which relies on a state of increased suggestibility in a client whose body is relaxed. This working definition is used by the people who practice hypnosis. The definition provided by the APA is a “state of consciousness involving focused attention and reduced peripheral awareness

characterized by an enhanced capacity for response to suggestion" (Lynn, et al., 2015, p. 390). The emphasis for both definitions is that hypnosis is a very natural process, which uses a human state of increased concentration and reduced distractions (Lynn et al., 2015, p. 390). Dell (2017) expanded the definition of hypnosis to also include not only hetero-hypnosis, but also self-hypnosis. Previously, hypnosis was considered a practice that involved another individual, often a therapist, who helped the client enter the relaxed state and guided him to the desired outcome; this is known as hetero-hypnosis. Self-hypnosis is the practice of inducing the relaxed state by one's self and undergoing the mental exercises of recreating and analyzing the situations and creating an understanding or alternative perspective by one's self. Dell also observed that enormous sudden stress can cause unpredictable reactions in people; however, prolonged exposure to stress can cause a person to normalize it and become accustomed to the reactions. The author was also able to determine some common characteristics for individuals who are capable of being easily hypnotized. These people were able to create fantasies with relative ease and can undergo self-dissociation. When dissociation is used as a coping mechanism, it can present itself as a short dormant period for the person that can almost make them appear as if sleeping followed by amnesia. Those who individually dissociate themselves with experiences have often been in abusive situations as children (Dell, 2017).

Hypnosis can be spontaneous and can happen either in extremely relaxed or stressful situations. For example, one can lay down on a couch and undergo self-hypnosis to deal with an experience. Contrastingly, victims of rape or violence have an out-of-body experience in which the person mentally distances themselves from the situation

allowing them to feel compassion for the victim, who is oneself (Barabasz, 2015). Therapists can enable people who cannot do this naturally to experience the same distancing effect and guide them to an understanding and a healthier means of dealing with the experience. Under hypnosis, a person can separate himself from reality and be guided through a scenario by the therapist. This ability to distance the experience from the emotions is necessary so that the patient can form an explanation or understanding for the situation (Masson et al., 2016).

Traumas often elicit one of two primary reactions from the body: Fight or flight. While these are the two most popular reactions, there exists a third possibility: Freeze. This reaction occurs when the person experiencing the trauma is incapable of conscious thought or action and merely allows the events to occur for themselves without any conscious regard for the consequences. People who experience a significant number of traumas can begin to exhibit physical deformations, such as a change in the heart rate, increased oxygen consumption, decrease in respiratory rate and body temperature (Masson et al., 2016). Both patient and therapist need to possess patience and an understanding of the individual in order to create the needed communication between the patient's traumatic memory and the physical body part that stores the memory. Through the practice of hypnosis guided by the therapist, the patient can develop a new perspective of the experience that will lead to an overall better quality of life. Multiple meta-analyses (O'Toole, Solomon, & Bergdahl, 2016) have demonstrated that hypnosis is capable of producing positive outcomes for a great variety of individuals suffering from both PTSD and dissociative disorder. This is all due to the technique's unique

ability to empower the person to gain a better self-understanding and to choose the means to cope and react to the experience.

There are many misunderstandings about hypnosis in both the non-professional and scientific community. From the perspective of the common individuals, hypnosis is thought to be capable of causing people to perform tasks that they would not otherwise, such as discussing unusual topics, acting uncharacteristically, or even performing murder. Such misconceptions come from the depiction of hypnosis in the media and are not representative of the actual hypnotic process (Aguado, 2015). Within the scientific community, hypnosis is sometimes considered a taboo practice since there has been little understanding of its physiological effects, which is primarily due to the lack of sufficient technology to accurately identify the variety of functions performed by the human brain. Methods, such as hypnosis, that do not rely on the direct modification of behavior by a fully conscious mind, unlike psychopharmacology, can be inaccurately deemed unsafe or unreliable. Many specialists in the field hold this viewpoint and are hesitant to explore alternative perspectives. Such reservations require further research to ensure the development of safe treatments; however, it can also hinder progressive, safe treatment methods (Wickramasekera, 2015b).

Buddha told a story about a king who asked blind people to describe an elephant after they touched it. All of them described what they felt, but they described only the one part that they touched. After a while, they started arguing with one another defending what each individual had described. Wickramasekera (2015b) related this story to the scientists who are able to read about successful outcomes using hypnotherapy in multiple

research studies, but still consider the practice to be ineffective and unsafe without the ability to provide any alternative evidence. Hypnosis is an instrument among many others available to therapists, and it should be treated as such. Its application, the induction of the individual into the relaxed state which makes them more suggestible, depends on the skills of the one applying it. The reaction to the hypnosis depends primarily on the participant since it is simply a state of heightened suggestibility; the participant or patient is still the same person merely in a state of reduced critical thinking meant to decrease the number of distractions experienced. In such a state, the participant may not be able to undergo thorough analysis of an action or an experience; however, the inherent, base principles or morals of the individual are still present (Aguado, 2015).

Hypnosis has been tested for a multitude of safe applications in addition to the treatment of PTSD. It has been able to treat people who experience physical reactions or mental discomfort from phobias or the inability to get rid of unwanted habits. Some examples of these include the relatively fast improvement of people suffering from obesity and providing individuals with the ability to quit smoking (Hauser, Hagl, Schmierer, & Hansen, 2016). Trypanophobia is the fear of needles, and it is a condition experienced by approximately 10% of the population. A woman requiring injection-based medication sought medical attention for her trypanophobia. Under hypnotherapy, it was discovered that the phobia had developed as a consequence of her drug abusing father in her childhood. After several sessions of hypnotherapy, she was able to hold the needle by herself (Kraft, 2016). Similar outcomes have enabled people who suffer from somatic illnesses to improve their sleep habits and their quality of life. Hypnosis has also helped

improve communication between patients and their doctors. Over 3,000 dental professionals in Germany receive hypnosis training and over 600 dental practices offer it as a service for individuals who are terrified of going to a dentist. Women have also undergone hypnosis to reduce the labor pain associated with childbirth (Hauser, et al., 2016). Hypnosis has also helped manage vasomotor symptoms, the discomfort of menopause, for many women (Wickramasekera, 2017). Due to the nature of hypnosis as a treatment, patients often experience long-lasting effects.

Hypnosis is used for the indirect treatment of physical deformations or psychological problems. It has helped improve the quality of life of people with irritable bowel syndrome, an example of a painful physical deformation (Dube & Ford, 2015; Shahbazi, et al., 2016). Additionally, people experiencing physical effects from phobias, such as those toward the natural environment, injections, blood, or injuries, have been able to either reduce the physical effect or to eliminate it. An example of this was found in a middle-aged woman who experienced severe fear during thunderstorms. She would constantly check the weather, and if it showed that a thunderstorm was likely to occur, she would experience crippling panic attacks. Under hypnosis, it was discovered that she associated it with bomb explosions and loneliness. After several sessions of hypnotherapy, she was able to return to a normal life by disconnecting the association she had developed (Kraft, 2016). Hypnotherapy can help patients who present to medical doctors with problems that seemingly have no physiological sources. This improvement in the patient's overall wellbeing can happen by increasing the quality of life of the patient or by providing treatment for patients whose psychological problems exhibit

physiological behaviors. For example, a woman reporting hearing problems was examined by multiple doctors and a magnetic resonance imaging (MRI) scan; however, no physical disturbances were found. Utilizing hypnosis and CBT, a psychologist was able to discover that a number of stressful events had produced a pattern of behavior that led to the damage of her inner ear (Gee, 2015).

Multiple sclerosis (MS) is among many of the diseases that has no medical solution, but hypnosis is able to improve the quality of life for those suffering from the effects of the disease. A case study of a 72-year old female who had MS was referred to a psychologist to improve her anxiety, depression, pain, and decreased physical mobility. The patient was previously unfamiliar with hypnosis, but accepted the treatment after her therapist provided a formal introduction. The therapist used music to induce a state of relaxation and, after several sessions of hypnosis combined with CBT, she was able to go back to her old hobbies of painting and taking walks with her husband. She continued her treatment sessions with hypnotherapy and guided imagery methods (Slatter, 2016). A treatment conducted on children with cancer demonstrated that hypnosis could help patients overcome the side effects of radiation and reduce the physical discomfort brought on by the treatment and the chronic pain. Many studies have concluded that patients who accepted additional hypnotherapy demonstrated faster recovery times than the control groups (Wickramasekera, 2017).

Because there are a variety of disorders and personalities, there is a wide range of treatment applications with hypnosis. One example of the types of hypnosis treatments involves age-regression hypnotherapy, which guides the patient to return to previous

experiences from his life potentially including his childhood. This enables the individual to remove the emotions or consequences connected to the initial trauma and allows them to develop a means of coping (Grogan, Barabasz, Barabasz, & Christensen, 2017). Through studies conducted on different methods of helping patients enter a state of relaxation, it has been discovered that extroverted people have difficulties staying in a concentrated hypnotic state and find it difficult to continuously follow instructions provided by the therapist. They often score high on posthypnotic amnesia tests (Zhang et al., 2017).

A common requirement for hypnotherapy is genuine empathy from the professional in order for the necessary trust to be formed between the patient and the therapist. Patients need to form a trusting relationship with the therapist before they are able to enter a deeply relaxed state of heightened suggestibility (Kaklauskas & Clements, 2016). A case study conducted on a patient who experienced long-term sexual abuse demonstrated this necessity well. She presented with a difficulty of opening up to people and an inability to form long-term interpersonal relationships. She had difficulty trusting people and getting them to understand her. In therapy, she made little progress until she met another woman with similar experiences who was able to share her story. Afterward, the patient was able to share some part of her own experience with the therapist, but it was not until the therapist was able to demonstrate genuine empathy and understanding before the patient was able to describe the full experience (Kaklauskas & Clements, 2016). Wickramasekera (2015 a) presents a deep exploration of the empathic involvement theory. The researcher described the work of the mind and human

perception. It allowed a better understanding of the phenomenon of hypnosis and its application in contemporary therapy and the connection with neuropsychology. Specifically, it was proposed that empathy induces a physiological effect on the brain and that understanding or attempting to visualize this connection can affect the empathy toward the self or others (Wickramasekera, 2015 a).

Improvement in technology has led to additional techniques in the practice of hypnotherapy. The combination of augmented or virtual reality (VR) devices with hypnosis has significantly improved the lives of many suffering from phobias and decreased the treatment time for those requiring physical therapy (Zhao, You, Shi, & Gan, 2015). Virtual reality involves the complete emersion of an individual into a virtual world whereas augmented reality is a virtual overlay on the physical world such as a hologram. Augmented reality (AR) studies have demonstrated that women are more susceptible than men to entering a hypnotic state, but men are able to achieve faster and more effective treatment with a combination of AR and hypnosis compared to conventional treatment methods (Zhao et al., 2015).

Hypnosis and PTSD

Hypnosis has a few distinct advantages as a treatment method for PTSD primarily due to the inherent ability for the patient to dissociate themselves from the traumatic experience (Abramowitz & Lichtenberg, 2010). The flexibility of the hypnosis treatments also allows for approaches targeted toward a particular individual's responses for maximum efficiency and the ability to quickly modify the treatment if something is deemed ineffective. Finally, it can be combined with other treatments such as CBT and

Gestalt to form a more complete treatment plan (Abramowitz & Lichtensberg, 2010). One method of hypnosis that can easily be incorporated into other treatments is olfactory conditioning. Through this, a therapist works with a patient to redirect olfactory associations to form a set of stimuli that have a positive reaction. This can help relax the patient or provide him with a tool to prevent panic attacks or other negative responses to other external stimuli. Due to the proximity of the olfactory sensors to the brain, the reactions and associations made through this process can take priority over many others. For example, developing an association of positive moods or behaviors toward a particular smell can provide a tool for people who are suffering from depression or mood swings to control their reactions. Similarly, preexisting negative associations or behaviors can be reduced by decoupling the reactions toward the smells involved in the experiences (Abromowitz & Lichtenberg, 2010).

There have been successful case studies of patients whose quality of life has significantly improved through the use of hypnosis treatments. For example, a victim of kidnapping and rape presented with PTSD including social anxiety, isolation, uncontrollable crying, panic attacks, and depression for 2 years after the incident. The hypnotherapist structured the treatment sessions first to reduce the anxiety and fear that she was experiencing and then to improve her self-esteem to improve her long-term mental health. During the first session, the therapist was able to determine that the source of her symptoms was not only due to the kidnapping and rape incident, but also due to her abusive relationship with her husband. Through the next three sessions, the therapist used eye movement desensitization and reprocessing (EMDR) to help her dissociate her

emotions from the experiences by focusing on a moving object with her eyes while describing the traumatic events. The therapist used hypnosis during sessions five through nine in order to help the patient develop methods to manage her emotional states and to improve her self-esteem. After the sessions, she reported that she had a new perspective on her husband's treatment toward her and the events that had happened to her. She stated that she was able to find happiness in her life and described her plan to form a healthy environment with her family (Rocha & Tellez, 2016).

During World War II, hypnosis became a relatively popular technique to treat *battle fatigue*, the term used for PTSD attributed to a war environment (Watkins, 2000). Due to the lack of medication, specialists, and facilities, the use of hypnosis grew in popularity, as it needed none of these resources. Therapy sessions included hypnoanalysis and positive suggestions while the patients were in a hypnotic state meant to improve their motivation. For some, the therapy sessions were even able to clear the physical symptoms they were experiencing. Because many had entered the war while they were young, the symptoms experienced by the soldiers regarding the stress of war were amplified by discontent memories from home. Strong emotions of anger, guilt, and depression were often associated with memories from their childhoods. Under hypnotherapy, if the professional was able to reduce the strong negative emotions related to a patient's childhood by providing them with an understanding and the ability to manage the emotions, their symptoms would significantly reduce and the war environment would become more easily adaptable (Watkins, 2000). An example of this phenomenon was found in a soldier who presented to a therapist with severe depression

and suicidal thoughts, as well as sleep apnea due to nightmares. Hypnoanalysis revealed that he felt significant animosity toward his father, which had accumulated from a young age. The therapist took five sessions to provide him with better coping methods, and the patient was able to experience reduced symptoms (Watkins, 2000). Similarly, another soldier who experienced complete memory loss after severe trauma was able to return to his family after 2 weeks of hypnotherapy (Watkins, 2000).

PTSD symptoms are usually enhanced by sleep deprivation, which can serve to further emphasize and mentally replay the negative experiences. Multiple studies have verified that hypnosis could help the patient understand the source of the stress that had led to the inability to sleep. The therapist was then able to guide the patient into forming a personal understanding and a means of coping with the stress. The participants in the studies were able to experience improved moods and more positive interpersonal relationships. Overall, the improved sleep habits also reduced the severity of the symptoms related to the PTSD (Galovski, Harik, Blain, Elwood, Gloth, & Fletcher, 2016).

While both military personnel and civilians have experienced PTSD and were treated using hypnosis, the techniques used for the two sets of populations and the effectiveness of the treatment appear to be different. For example, military personnel with PTSD were found to enter a hypnotic trance faster and to a deeper extent than civilian populations (Eads & Wark, 2015). Eads and Wark (2015) presented three case studies of the effectiveness of hypnosis in the treatment of PTSD in military personnel. The first one was related to a veteran who served as a transporter in the military. During his

service, the patient was witness to many explosions and the deaths of both colleagues and close friends. Upon returning home, he was incapable of driving a car without entering into dangerous situations due to flashbacks from the war, and his relationships deteriorated as he became irritable over loud noises or even the voices of his family members. During the first session, the therapist explained the treatment plan involving hypnosis. The practitioner then used hypnotic suggestions to present a picture of a happy family experience in the car with the patient as the driver. From there, the therapist guided the patient into associating driving in general to driving with his family in the car and emphasized the importance of protecting his family members while they were in the car. After several sessions, the patient reported that he had developed safe driving habits, which were confirmed by his wife who also described him as a much more caring father and husband (Eads & Wark, 2015).

The second case study involved a veteran who returned home after several deployments and exhibited overly aggressive behavior. He described his behavior as empowering his freedom, but it had caused him to lose his job and family and prevented him from having satisfying social interactions. After attempting several conventional methods of treatments and finding the patient uncooperative, the therapist found that the heightened suggestibility and the relaxed state provided by the hypnotic trance made the patient more responsive. The therapist then used hypnotic suggestions to enforce the values of a caring, helpful, calm individual who is capable of allowing others to make their own decisions and treats others with the respect deserved by equals. The therapist helped him form a plan for social and personal development and a positive mindset. After

several of the sessions, the patient reported that he was able to open up about his experiences and the treatment with other military veterans. He was able to form a meaningful romantic relationship and was able to reconnect with his child (Eads & Wark, 2015)

A final case study involved a patient with a history of treatments for mental disorders following military deployments who persistently presented with over aggression and general disrespect toward people. After several treatments proved ineffective for him, he lost respect for psychology in general and expressed his disappointment with the mental health programs available. His therapist first tried a variety of CBT techniques, but the patient refused to cooperate and responded to instructions with sarcasm. The therapist determined that the relaxed state and heightened suggestibility provided by hypnosis treatments would prove ideal for the situation. Under a hypnotic trance, the therapist presented the patient with topics and behaviors that stimulate positive social interactions and emphasized socially acceptable values. After several sessions, the client called the therapist to relate an experience that had demonstrated the effectiveness of the treatment. An assailant had attacked his son and injured him badly. The patient's initial response was to retaliate by murdering the assailant, but by practicing the techniques developed with the therapist, he was able to understand the importance of spending the time with his injured son in the hospital and cooperating with law enforcement officials to capture the assailant. In the following sessions, the patient reported a significantly more relaxed state and no criminal acts

committed; he was able to work with the therapist to develop long-term goals and form a stable romantic relationship (Eads & Wark, 2015).

Military personnel are trained to endure mental traumas and to suppress their natural emotional responses. This can lead to a buildup of negative experiences in an environment in which even a single event can cause an unmanageable trauma. Due to this training, many find conventional methods of treatment of PTSD to be unsuccessful since they can find it difficult to open up or to consciously recall the experience if they learned to cope through selective amnesia. After they are discharged, many of them find it difficult to adapt to civilian life in which there are no directions or instructions from another, and they have to face personal responsibility for every action (Eads & Wark, 2015). They can also find themselves without the support of colleagues like they had while they were serving, and, if they are not able to adapt quickly enough, they can even lose the support of family members and other loved ones. The relaxed environment, free of adrenaline, can lead to nightmares and aggression. The latter of these can further cause the loss of family members and friends, criminal activity, or suicide and self-harm (Eads & Wark, 2015).

Military personnel returning from the war environment could become resistant to conventional methods of PTSD treatment. An example of a 37-year old patient who had served in Desert Storm demonstrated the difference in the approaches. When a therapist attempted to treat her with the conventional methods, she simply refused to speak about herself or her experiences. The therapist then tried a technique called storytelling, which can be used to induce hypnosis. After the therapist was able to guide her into a relaxed

state to help her understand the necessity to share and trust, she continued therapy for another six months. During this time, she formed a more positive outlook on life and was able to develop a means of coping with her experiences. (Gafner, 2016). Conrad (2016) described the use of the storytelling technique as a method of induction as one very dependent on the leadership skills of the therapist. The practitioner must be able to create an interesting topic with which the patients can interact and instill a sense of inspiration into them.

One of the benefits of using hypnotherapy as a treatment for PTSD is that it provides long-term results because it enables the patient to develop an understanding for the source of the problem and then form a set of tools which they deem comfortable to use in managing the experience. A patient who served in Iraq and Afghanistan provided an example of this. Upon returning home, he sought treatment for PTSD through The Department Veteran Affairs (VA). He disliked going to group therapy and therefore stopped attending. Instead, he got a job with the Public Safety Office, but an incident left his partner and several other people dead in his hands while at work. Around the same time, a close relative was severely injured during a car accident that happened during the patient's shift. Both of these scenarios amplified the PTSD symptoms, and, after a psychological evaluation, he was terminated from his job. Soon afterward, financial instability forced him to stop attending any therapy sessions. After a few more unhappy years, he was able to enroll in hypnotherapy-based sessions. The therapist first used hypnosis to help him develop a means of dealing with the symptoms and then taught him self-hypnosis. After several more sessions, he learned breathing exercises and the

therapist used EMDR to further help him resolve the source of the PTSD. He was able gain an improved quality of life (Moss, 2017). This case study demonstrated the ability for treatment options, including hypnotherapy, to help a resilient patient; however, many other patients do not have the self-motivation to keep seeking help and turn to self-medication and alcohol abuse.

Within civilian populations, the age range for which hypnotherapy has had successful case studies is extensive. A case study was conducted by Serpers, van der Boon, and Landsmeer-Beker (2016) on two children, a 2-year old girl and an 8-year old boy who demonstrated PTSD after a series of medical procedures. Both received psychological treatment using hypnosis techniques in which the children were helped to redefine the formed associations related to the procedures to reduce the fear they were experiencing. Additionally, the therapist helped provide them with tools to better manage the anxiety that they faced immediately before and during the surgery. These sessions successfully reduced the symptoms experienced by both the boy and the girl. However, the hypnosis treatments were also provided to the parents of the two children since PTSD could affect not only those who have the direct experience but also those who are close to them (Serpers, et al., 2016).

Summary and Conclusions

PTSD is a vastly widespread disorder. Many people suffer from PTSD, but because of the fear of what others might say or the possible disapproval of their friends and colleagues, they may never pursue professional help (Halford, 2016). Many such individuals could not find effective solutions and turn to drugs and alcohol (McDevitt-

Murphy et. al, 2017; Wilson, et al., 2017). Since people in highly stressful situations such as wars are more likely to develop PTSD, as the duration of wars increases, the number of individuals who have PTSD increases as well. Regardless of whether the PTSD was developed in a military or civilian environment, the disorder can have long-term, debilitating effects on a person's mental health. This long-term effect on the mental well-being of individuals shows the necessity of finding ways to help those people as fast and effectively as possible. Hypnosis is a tool available to many practitioners, but because of misunderstandings, it has not been accepted as an official treatment for many years (Wickramasekera, 2015 b). In recent years, some researchers have seen the benefits of hypnosis and have conducted significant research regarding its use in an attempt to help the many people who need to overcome their PTSD symptoms. However, there currently exists insufficient research linking the effectiveness of hypnosis with two categories of people, military and civilians, who suffer from PTSD. By analyzing the effectiveness of hypnosis as a treatment method in military personnel and comparing it to the effectiveness of the same treatment for civilians, the ideal scenario and personal characteristics of patients who would most benefit by hypnosis as a treatment for PTSD can be determined. This outcome was expected to be produced by investigating the differences in the causes of the traumas and the characteristics of the individuals of the two groups and correlating those differences to the effectiveness of the treatment of each group. The methods for the investigation are detailed in the description of the study for the meta-analysis in Chapter 3.

Chapter 3: Research Method

Introduction

The symptoms of PTSD have been well known, and with the progression of research in the subject, the disorder has had different names. The latest name given to these symptoms emerged with the development of the *DSM-3* (Zoladz & Diamond, 2016). Along with depression, anxiety, and self-isolation, many people with PTSD have a problem communicating with others (Fredman et al., 2017). Most of the time they try to stay away from others, and when they try to converse, their interactions remain short and sometimes unintentionally result in an unpleasant tone or manner. People with PTSD sometimes demonstrate antisocial behavior or are involved in criminal activity (Fredman, et al., 2017). Unable to cope successfully with PTSD, they turn to alcohol and drug abuse (Wilson, et al., 2017).

Hypnosis has been listed as an official treatment for medical purposes since the 18th century. Mesmer introduced it as animal magnetism and believed that the hypnotist transferred their energy to the patient (Loubser, 2016). Because the client was in a relaxed state and appeared to be asleep, the process introduced by Mesmer was named hypnosis from the Greek word *hypnos*, which means sleep (Loubser, 2016; Shahbazi et al., 2016). During hypnotherapy, the client separates themselves from the reality of the moment and follows the picture described by the therapist. In this way, the patient will have an opportunity to see the traumatic event from a different perspective and will give themselves an acceptable explanation (Masson et al., 2016).

Hypnosis is a good tool for helping people with PTSD because it provides flexibility, by easily changing the approach depending on the patient's reaction as well as its ease to combine with other methods and techniques (Abramowitz & Lichtenberg, 2010). Wars all around the world create individuals with PTSD, and these individuals need fast and successful treatment. Many survivors of domestic violence also need help with their PTSD, but some of them are afraid of medication and long-term therapy. Therefore, it is necessary to produce a wide variety of treatments, including hypnosis, and understand the conditions under which these treatments are most ideal.

The purpose of this meta-analysis was to determine the traits and conditions under which the treatment of hypnosis is most effective by comparing the results of studies conducted on civilians and military personnel. The following chapter details the methodology involved in the statistical analysis necessary for this comparison. I will also describe the selection process for the source studies for the meta-analysis and provide a breakdown of the statistical methods used in the selected software package. Finally, it will include the risks to the validity of the study and the analysis of the biases created by the meta-analysis.

This study was organized to give answers to the following research questions to guide this study:

RQ1: What are the ranges of effect sizes, including 95% confidence intervals, for hypnosis as a treatment for deployed personnel and civilians suffering from PTSD?

RQ2: What are the overall mean effect sizes, including 95% confidence intervals, for hypnosis as a treatment for deployed personnel and civilians suffering from PTSD?

RQ3: Do the effect sizes differ from the overall mean effect size based on moderator variables such as whether hypnosis was used in combination with a cognitive behavioral therapy or the duration of the therapy?

The answers to these questions were clarified, and a comparison was provided for the effectiveness of hypnosis for both groups. The results could help many people in need to find the best treatment approach based on their individual circumstances.

Research Design and Rationale

The meta-analytic approach could help better understand the effect of hypnosis on military and civilian populations. The differences in the populations could have led to different treatment effectiveness. There was already research done on the topic with different technologies and numbers of people for the efficacy of hypnosis as a treatment of PTSD. Due to small technical deviations, the same experiment or theory in the treatment of PTSD using hypnosis may not work well in another application, and scientists or practitioners have to repeat similar experiments again with new subjects. By using meta-analysis, it is possible to present a more cohesive conclusion from the many research studies and reduce the misunderstandings presented by reviewing only a selection of the available material (Card, 2012).

This research was organized as a meta-analysis because it allows the scholar to collect and compare data from many studies. The current rate of published research

makes it difficult to be able to follow all the relevant studies conducted and draw a clear conclusion on the overall effectiveness of the treatment. The meta-analysis presents a synthesis of a group of materials and offers statistical conclusions about a question that unifies those studies (Card, 2012). This meta-analysis did not involve a prolonged research experiment and did not involve any test subjects directly; therefore, time was not an influence on the design of the study. The research compared the effect size of the studies made with military personnel and the effect size of studies made with civilians. Comparing those two categories presented a clear picture of the efficacy of hypnosis to these two groups of people and offered a collection of similar traits or characteristics for which treatment using hypnosis is likely to be most effective.

Methodology

Sampling and Sampling Procedures

Multiple databases were used to search for qualifying studies, including PsycINFO, MEDLINE, SocINDEX, EBSCOhost, Google Scholars, ProQuest, and Academic Search Complete. The following keyword search terms were used: *hypnosis, hypnotherapy, PTSD, treatment, alternative treatment* as well as different combinations of these terms. This meta-analysis used studies that included the populations of military and civilians with PTSD whose treatment was at least partially comprised of hypnosis. For the purpose of the study, inmates were assumed to be part of the civilian population unless otherwise stated by the source study itself. Another condition for inclusion in the source studies was the use of randomized trials in the research detailed by the study. The minimum number of people who participated in the source research had to be no less than

10 to satisfy statistical significance. The studies had to be quantitative, and the authors must have provided the effect size or the necessary data to calculate it, namely the size of the source study population, mean, and standard deviation. Additional criteria for excluding source studies used in this meta-analysis included the use of nonadult populations, case or single–subject studies, and studies involving a multitude of diagnoses. The inclusion criteria limited source studies top those from peer-reviewed journals and dissertations to decrease the chance of disreputable resources for the source information and also excluded heavily-biased studies. The inclusion of both peer-reviewed journals and dissertations was an attempt to decrease the chance of using materials whose data was purposefully adjusted to produce results that were easy to publish. Studies that were reviewed but were not included as a part of the quantitative portion of the meta-analysis were used for the detailed qualitative analysis and for providing examples of further research that may be necessary. Table 1 shows a summary of the inclusion criteria.

Table 1

Summary of Inclusion Criteria for Studies Used for Source Material

Inclusion Criteria Categories	Specific Requirements
Source of Study	Peer-reviewed journals and dissertations
	Included in one of the following databases: PsycINFO, MEDLINE, SocINDEX, EBSCOhost, Google Scholar, ProQuest and Academic Search Complete
	Has one or a combination of the following key terms: Hypnosis, hypnotherapy, PTSD, treatment, alternative treatment
	English language
Type of Participants	Adults (over the age of 18)
	Diagnosed with PTSD and treated at least partially with hypnosis
Types of Study	Quantitative analyses
	Use of randomized trials
	Sample size greater than 10 individuals
	Measurable statistics include effective size or the mean and standard deviation

Data Extraction

The process of extracting data from the source studies in a Microsoft Excel spreadsheet that included the name of the authors, the year the study was conducted, the sample size, the population description, the mean, standard deviation, the *p* value, and the effective mean, if provided. The studies that were excluded from the meta-analysis were separated for use in the literature review, further analysis, or recommendations for future research. The remaining studies were entered into the Review Manager 5.3 (RevMan5) software analysis package, which was published by the Cochrane Community and released in June 2014.

RevMan5 was able to display a summary of the biases that resulted from the source studies and the analysis. This was accomplished through the software package itself once the program was given all the data for the source studies. The results of the risk of biases analysis was presented in the form of tables and figures. These were analyzed as a part of the result analysis section of the study. This software package was selected both for the readily available detailed descriptions of the statistical methods that it used as well as for its availability to students; therefore, the software package was influenced by resource availability.

Statistical Analysis Methods

The RevMan5 software package uses the Mantel-Haenszel test for the primary meta-analysis method when comparing results across multiple studies. This method is designed to analyze the results of the source studies by reducing them to a table of binary results that tabulate whether an event was experienced (Deeks & Higgins, 2010). In order to understand the effect of the software package and to understand the assumptions made in the statistical calculations that may present themselves as biases during the analysis of the results, the user has to understand the conditions and equations used to calculate the test statistics.

For the purpose of this study, the event, used in the following definitions, was the successful treatment of PTSD using hypnosis. The independent variable was whether the subjects are civilians or military personnel, and the dependent variable was whether they were successfully treated for PTSD using hypnosis. The method reduced the table into four categories:

a = number of subjects of experimental group who experience the event

b = number of subjects of experimental group who do not experience the event

c = number of subjects of control group who experience the event

d = number of subjects of control group who do not experience the event

The Mantel-Haenszel method then used the following formulas to produce the odds ratio (OR) which was defined as the probability of an event occurring under the exposure of the dependent variable over the probability of the event happening without the exposure of the dependent variable. Within the scope of this study, the odds ratio was defined as the ratio of the likelihood that the subjects were successfully treated for PTSD using hypnosis over the likelihood that the subjects were successfully treated for PTSD with any treatment method (Deeks & Higgins, 2010).

$$ln(OR) = ln\left(\frac{\sum w_i OR_i}{\sum w_i}\right) \quad (1)$$

The method defined all summations to be over *i* from 1 to the number of studies. It also defined the weight, *w*, given to each study through the following formula.

$$w_i \frac{b_i c_i}{N_i} \quad (2)$$

N was given as the total number of participants in the study through the number of the subjects of the experimental group, n_1, and the number of subjects of the control group, n_2.

$$N_i = n_1 + n_2 \quad (3)$$

It additionally used the standard error of the log odds ratio provided above. This was defined through the following relationships (Deeks & Higgins, 2010).

$$SE\{ln(OR)\} = \sqrt{\frac{1}{2}\left(\frac{E}{R^2} + \frac{F+G}{RS} + \frac{H}{S^2}\right)} \quad (4)$$

$$R = \sum \frac{a_i d_i}{N_i} \quad (5)$$

$$S = \sum \frac{b_i c_i}{N_i} \quad (6)$$

$$E = \sum \frac{(a_i + d_i) a_i d_i}{N_i^2} \quad (7)$$

$$F = \sum \frac{(a_i + d_i) b_i c_i}{N_i^2} \quad (8)$$

$$G = \sum \frac{(b_i + c_i) a_i d_i}{N_i^2} \quad (9)$$

$$H = \sum \frac{(b_i + c_i) b_i c_i}{N_i^2} \quad (10)$$

The heterogeneity test statistic provided the variation in the outcomes of the studies; the I^2 statistic provided the percentage of variation due to true heterogeneity rather than pure chance. The heterogeneity test statistic tested against the null hypothesis that there were no differences between the effectiveness methods of hypnosis treatment for PTSD in civilian or military personnel in this meta-analysis. This was modeled by a chi-squared distribution. For the purpose of the Mantel-Haenszel method, the heterogeneity test statistic could be calculated using the following formulas (Deeks & Higgins, 2010).

$$I^2 = max\left\{100\% * \frac{Q-(k-1)}{Q}, 0\right\} \quad (11)$$

In the above, *Q*, the test statistic, could be represented by the following summation.

$$Q = \sum w_i (\theta_i - \theta_{MH})^2 \quad (12)$$

In the above, the θ_i was the log odds ratio and the weight, w_i, was redefined as the inverse square of the standard error (Deeks & Higgins, 2010). The final *Z* value was provided by the following equation and tested against the null hypothesis that there was no overall effect of hypnosis in the treatment of PTSD in civilian and military personnel populations (Deeks & Higgins, 2010).

$$Z = \frac{\theta}{SE(\theta)} \tag{13}$$

The above was used to provide an answer to the first research question of this dissertation. The more significant result from this dissertation was the difference between the treatment of PTSD using hypnosis in the two groups, civilians and military personnel. To determine the statistical significance of this effect, the statistical analysis had to include a comparison between the two subgroups. To this end, the RevMan5 software package used the following relationships that iterate over the subgroups *j*. The analysis followed a similar method to the one described above in which a weighted effect size, θ_j, was calculated for each of the subgroups, and this was then used to determine the total effect size across subgroups, θ_{tot}. The weight for each subgroup, w_j, and the total effect size were provided by the following equations (Deeks & Higgins, 2010).

$$w_j = \frac{1}{SE\{\theta_j\}^2} \tag{14}$$

$$\theta_{tot} = \frac{\sum w_j \theta_j}{\sum w_j} \tag{15}$$

For the case of comparison between the two subgroups, the test statistic *Q* was calculated by the following equation. This tested the null hypothesis that there was no difference in

the effect of hypnosis treatment of PTSD between the two groups, civilians and military personnel using a chi-squared distribution (Deeks & Higgins, 2010).

$$Q = \sum w_j \left(Q_j - Q_{tot}\right)^2 \tag{16}$$

Finally, the heterogeneity test static, I^2, which tested for the differences determined due to heterogeneity rather than chance between the two groups, was determined by the following relationship.

$$I^2 = max\left\{100\% * \frac{Q-(S-1)}{Q}, 0\right\} \tag{17}$$

In the above equation, *S* referred to the number of subgroups (Deeks & Higgins, 2010).

Validity and Reasoning

Meta-analysis studies are highly dependent on their source material for the external validity of their results. As such, the conditions under which source studies were conducted could not be directly controlled. However, careful attention was given to the methods and analysis provided by the source studies to eliminate any obviously biased or invalid conclusions. Such studies were eliminated from the source studies to be used in the meta-analysis. A wide range of sources was also used in order to reduce potential systematic deviations of valid results such as in studies that have adjusted data to fit a predetermined outcome. Because no study can be completely without any biases, the source studies selected for the meta-analysis were carefully evaluated and any bias was clearly defined to be considered in the final interpretation of the results.

Any threats to the external validity of the meta-analysis most likely came from the validity analyses of the source materials. In addition, design choices made on the meta-analysis could also create external validity threats. One such example was the choice of

RevMan5 as the software package used for statistical analysis. This was selected based on resource limitations, as this package and the necessary material for understanding the functionality of the tools were both readily available to students. Internal validity of the meta-analysis was most likely to come from the design choices made relating to the statistical analysis. Some examples of this included the number of studies selected for the initial source studies and the final count selected for the statistical analysis. To ensure that statistical significance was met, the total count of studies was determined based on the need to meet the statistical definition of significance and that it also followed common practice for peer-reviewed published meta-analysis. Further analysis to the external validity of the study will be provided in the discussion section, as that incorporates the results from the bias analysis.

Ethical Considerations

The meta-analysis did not directly interact with any individuals; therefore, direct violations of ethical standards were not expected. This did not excuse the use of source materials that involve inhumane or disreputable practices. Because of this, the meta-analysis reviewed the source studies used for the research to confirm that no unethical practices have been involved. The potential for unethical practices was also reduced by the sole use of peer-reviewed studies and dissertations, as part of their criteria was that they have undergone ethical evaluation by their respective institutions.

Summary of Design and Methodology

The meta-analysis was designed to produce a summary of the best scenario, specifically the personal characteristics and conditions, under which hypnosis was likely

to be most effective as a treatment of PTSD by comparing military and civilian populations who have been treated using this method. Because there are already many studies providing a direct measure of the effectiveness of hypnosis without reaching a conclusive answer, a meta-analysis was an appropriate approach. The meta-analysis was structured to start with approximately 100 studies that originate from peer-reviewed journals, dissertations, and published works in the industry. These were reviewed, and a select number were chosen based on the previously described criteria to be used for the statistical analysis portion of the study. These were further analyzed for potential biases and unethical practices before being used to calculate the test statistic using the Mantel-Haenszel method as a part of the RevMan5 software package. This package also provided an analysis of the biases involved in the study. Both of these sets of results, which will be detailed in Chapter 4, were used to provide a detailed qualitative analysis of the results from the test statistic.

Chapter 4: Results

Introduction

Hypnosis has been used in different forms for a long time, but it became more modernized through the efforts of George H. Estabrooks, Milton Erickson, and Dave Elman. Hypnosis has been proposed as a method of treatment for PTSD and has been used notably during war, especially when material resources became unavailable or scarce (Watkins, 2000). Currently, the most popular treatment for PTSD is through CBT; however, that often has a long treatment time and patients who have been treated by it are at risk of remission (Qi, et al., 2016). Hypnosis has become a more uncommon practice because its physiological effects on the human brain are not entirely understood by the medical community; however, multiple studies have indicated its effectiveness as a treatment for PTSD (Wickramasekera, 2015 b). The purpose of this study was to provide specific characteristics of the patients and situations in which hypnosis proved to be an effective treatment method to serve as a guideline for professionals. The significance of this study was to provide a wider range of treatment methods and to improve the quality of life of people suffering from PTSD.

The meta-analysis was conducted by reading through the relevant, extant quantitative studies and applying the pre-determined exclusion criteria until a collection of source studies was created. The collected sources were then input into RevMan5 software package for quantitative analysis. The following three research questions and corresponding hypotheses guided this study:

RQ1: What are the ranges of effective sizes, including 95% confidence intervals, for hypnosis as a treatment for deployed personnel and civilians suffering from PTSD?

$H_0$1: The ranges of effective sizes for both military and civilian personnel will be less than 0.2 based on Cohen's d definition of effective size.

H_A1: The ranges of effective sizes for military and civilian personnel will be greater than or equal to 0.2 and less than 0.8 based on Cohen's d definition of effective size.

RQ2: What are the overall mean effective sizes, including 95% confidence intervals, for hypnosis as a treatment for deployed personnel and civilians suffering from PTSD?

$H_0$2: The mean effective size for both military and civilian personnel will be less than 0.5 based on Cohen's *d* definition of effective size.

H_A2: The mean effective size for military and civilian personnel will be greater than or equal to 0.5 based on Cohen's *d* definition of effective size.

RQ3: Do the effect sizes differ from the overall mean effect size based on moderator variables such as whether hypnosis was used in combination with cognitive behavioral therapy or the duration of the therapy.

$H_0$3: The range of and overall mean effect sizes including 95% confidence intervals, for hypnosis as a treatment for deployed personnel and civilians are below 0.20.

H_A3: The range of and overall mean effect sizes including 95% confidence intervals, for hypnosis as a treatment for deployed personnel and civilians are above 0.20.

Data Collection

The studies used in this meta-analysis were found in peer-reviewed journals and dissertations located in the following online databases: PsycINFO, MEDLINE, SocINDEX, EBSCOhost, Google Scholars, ProQuest, and Academic Search Complete. The key words used in the searches were *hypnosis, hypnotherapy, PTSD, treatment, alternative treatment* as well as combinations of these terms. The requirements for initial inclusion were that the studies were in English and involved adult (over the age of 18 years old) subjects with PTSD, who were treated by a form of hypnotherapy. The studies were then further reduced on the basis of employing quantitative analyses with results that included effective size or the mean and standard deviations. The studies were additionally required to have a sample size of more than 10 participants and the use of randomized trials for inclusion in order to reduce bias. Finally, when conducting the quantitative analysis, an additional criterion was added related to the measures used in the studies. For example, some studies qualified by all other metrics, but the scale used was not specific to PTSD; instead it was more general to the psychological condition of the participant. Because this would have impacted the validity of the meta-analysis, such studies were excluded. To better verify the significance of the results, the statistical analysis was conducted for both pre- versus post- and control versus experimental

treatments when the source study permitted it. Figure 1 shows a flow chart of the exclusion process that led to the final selection of source studies.

A total of 13 studies were determined to have sufficient data based on the exclusion criteria and to comply with all the prerequisites to be considered source studies. Table 2 presents the distributions of the population based on the intended use for the meta-analysis. The total number of participants in the studies are separated into military personnel and civilian populations in the table. Because the first research question was related to the effectiveness of hypnotherapy as a treatment for PTSD, the populations were further divided into control and experimental groups for the first statistical analysis, and then in order to verify the outcome, the populations were also divided between pretreatment and posttreatment. It is worth noting that not all studies provided both sets of data; therefore, the total number of participants differed between the experimental versus control analysis and the pre- versus posttreatment analysis.

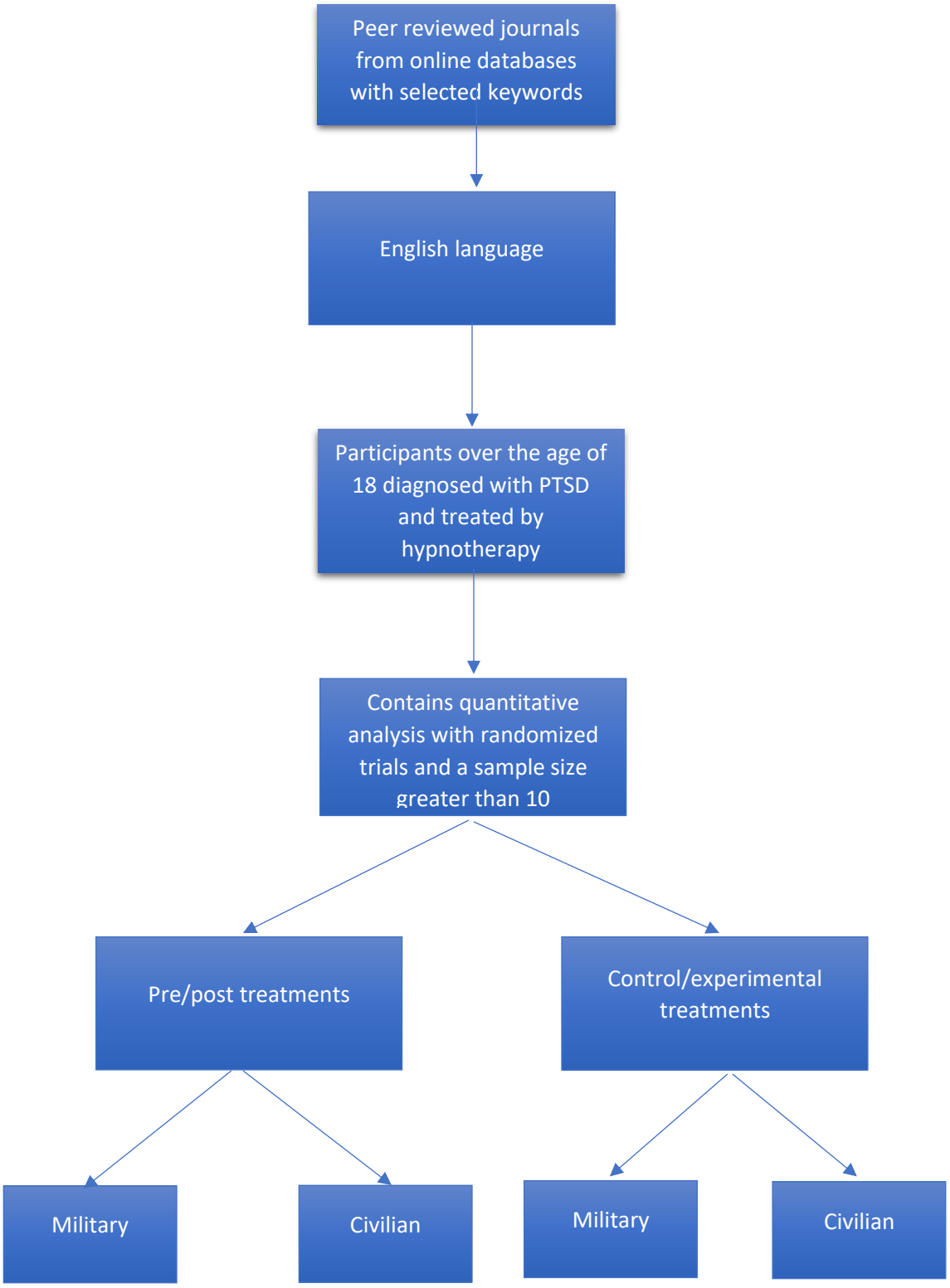

Figure 1. Exclusion criteria and categorization of studies for quantitative analysis.

Table 2

Population Distributions of Source Studies

	Military *N*	Civilian *N*	Total *N*
Total *N*	201	496	697
Control *N*	90	290	380
Experimental *N*	88	275	363
Pre-/Posttreatment *N*	99	351	450

Source Study Description

The current available research studies conducted on the effect of hypnotherapy, specifically for adults with PTSD, used a variety of measures. Because of this, the random effect was used for this portion of the quantitative analysis and the measures were carefully selected based on relevance to PTSD. While the measures could be different, they had to target PTSD rather than a broader depression or general participant comfort. Each study used a set of measures deemed most appropriate by its researchers; however, for the meta-analysis, the measures were prioritized and a table of the instruments in each study was developed. Among all studies, 27 measures were used, but many were only related to anxiety, were interview-based, or were relatively rare and would lead to greater artificially inherent variance in the results. Therefore, only 5 instruments were used in the meta-analysis, and they were prioritized based on PTSD relevance. For each source study, a single measure was chosen to be representative based on the created prioritized list. Table 3 lists the prioritization order of the measures.

Table 3

Priority of Measures

Priority	Acronym	Measure
1	CAPS	Clinician-Administered PTSD Scale
2	PCL	PTSD Checklist
3	DASS-21	Depression, Anxiety and Stress scale
4	IES	Impact of Events Scale
5	BDI	Beck Depression Inventory

The highest priority was given to the CAPS to have the highest priority because it was developed and tested for high correspondence to the PTSD diagnosis as defined by the *DSM-5* (Weathers, Lee, Bovin, Sloan, Kaloupek, Keane, …, Marx, 2018). The PCL was determined to be second in priority because it has high credibility in the correspondence to the PTSD diagnosis as defined by the *DSM-5*, but it is less popular among the studies found on hypnosis as a treatment for PTSD (Ghiazali & Chen, 2018). The DASS-21 is not a direct measure of the PTSD diagnosis but has the dominant factors involved in a PTSD diagnosis and has had researchers demonstrate its validity (Kok, van der Meer, Najavits, & De Jong, 2015). IES is a much broader measure, but it is very commonly used in many research studies related to PTSD, and its validity as a measure for PTSD has been confirmed by several studies (Hyland, Brewin, & Maercker, 2017). Finally, lowest priority was given to BDI because the instrument is not directly testing for PTSD but rather for the broader category of depression. The BDI has been validated as a measure of PTSD and is popular within research studies on the subject (Beck, Guth, Steer, Ball, Mori, Lambert, …, LoCostro, 2003). Table 4 lists the studies defined by the markers that were used to reference them throughout the meta-analysis and the measures that were available in each study.

Table 4

Measures Used in Each Source Study

Study	Measure
Barabaz, 2013	PCL
Abramowitz, 2008	PDS, IES, BDI
Apostolo, 2009	DASS, PICS
Galovski, 2016	CAPS, BDI, PSQI, Insomnia Severity Index
Bryant, 2003	CAPS, IES, STAI, BDI, CCQ
Bryant, 2005	IES, BAI, BDI
Carlson, 1998	Mississippi Scale for Combat Related PTSD, IES, PTSD Symptom Scale, BDI, STAI
Cusak, 1999	SI-PTSD, SCL-90, IES, BASA, DAST, SUDS, VOC
Devilly, 1999	STAI, BDI, SCL-90-R, SUD, PPD, CMS, IES, PSS-SR, PTSD-I, CEQ, DEVS-T
Devilly, 1998	Mississippi Scale for PTSD, BDI, STAI, PPD, SUD
Edmond, 1999	STAI, BDI, IES, BI
Thunker, 2012	BDI
Cook, 2010	PSQI, BDI, SF-36 PTSD MC, CAPS
Krakow, 2001	PSQI, CAPS, PSS

Table 5 summarizes the source studies used in this dissertation. The table includes whether the population is civilian or military personnel, the total number of participants, and the measure selected to be used in the quantitative analysis. Additionally, the table provides a descriptor of the control group that was used in the experimental vs control comparison between military and civilian personnel. Such studies were only used in the pre- versus posttreatment analysis of the effectiveness of hypnosis as a treatment for PTSD.

Table 5

Summary of Source Studies and the Respective Measure Selected for the Quantitative Analysis

Study	Population	Total *N*	Control	Selected Measure
Barabaz, 2013	Civilian	36	none	PCL
Abramowitz, 2008	Military	32	Zolpidem	IES
Apostolo, 2009	Civilian	30	none	DASS
Galovski, 2016	Civilian	92	CPT	CAPS
Bryant, 2003	Civilian	58	SC	CAPS
Bryant, 2005	Civilian	47	CBT	CAPS
Carlson, 1998	Military	22	RCC	IES
Cusak, 1999	Civilian	27	NA	IES
Devilly, 1999	Civilian	23	NA	BDI
Devilly, 1998	Military	23	NA	IES
Edmond, 1999	Civilian	37	none	IES
Thunker, 2012	Civilian	20	none	BDI
Cook, 2010	Military	124	SNM	CAPS
Krakow, 2001	Civilian	126	none	CAPS

Note: A definition of none *means that the control involved no symptom alleviation or alternative treatments to hypnosis. In contrast, a definition of* NA *means that the study did not involve a control group.*

Because the source studies selected used a variety of measures, the quantitative analysis was conducted using random effect rather than fixed effect. The purpose of selecting random effect was to normalize some of the differences produced by the numerical variation within the scales themselves. The heterogeneity tests whose results are presented throughout the results section provides support for this decision.

Table 6 depicts the biases that were determined to be of high risk in each of the studies. The most common one was the blinding of participants and personnel and allocation concealment. These were often considered high risk since the researcher involved in developing the study and analyzing the results was involved in the application of hypnosis. Alternatively, for the bias of allocation concealment, the risk was

evaluated to be high since the participants who received the additional treatment of hypnosis would have known which group they were in, the experimental or control. This had a lesser impact on the pre- versus posttreatment studies, but it had a great impact on the control versus experimental studies. In Table 6, the biases, as defined by RevMan5 (2014), were listed for each of the source studies. The definitions of the biases are as follow:

- Bias A was random sequence generation (selection bias)
- Bias B was allocation concealment (selection bias)
- Bias C was blinding of participants and personnel (performance bias)
- Bias D was blinding of outcome assessment (detection bias)
- Bias E was incomplete outcome data (attrition bias)
- Bias F was selective reporting (reporting bias)
- Bias G was other biases

Table 6

Bias Analysis for Each Source Study

Study	A	B	C	D	E	F	G
Barabaz, 2013		x	x				
Abramowitz, 2008		x	x				
Apostolo, 2009	x		x				
Galovski, 2016			x		x		
Bryant, 2003					x		
Bryant, 2005				x			
Carlson, 1998					x		
Cusak, 1999				x			
Devilly, 1999				x	x		x
Devilly, 1998					x		x
Edmond, 1999			x				
Thunker, 2012			x	x			x
Cook, 2010							x
Krakow, 2001			x				

Apostolo (2009) did not randomly assign participants to the control and experimental groups but rather placed the first participants who entered the hospital into the experimental group; this introduced selection bias. The study avoided the allocation concealment bias since they administered treatments to the two groups during completely different time periods. The study by Bryant and his colleagues (2003) began the experiment with 58 participants of which 13 dropped out. This put the drop rate at 23%, which was relatively high and therefore was at a high risk for attrition. Bryant and his colleagues (2005) study was marked as having a high risk of blinding outcome assessment (detection bias) since the administrators of experiment provided the participants with a description of the rationale behind the treatment, which likely predisposed them to believe in its effectiveness. The Carlson, et al., (1998) study had a

26% drop rate since the initial count of the participants was 47, 12 people dropped out during parts of the pretreatment, and 4 more dropped out during the posttreatment. The Cusack and Spates (1999) study recruited its participants through advertisements and public postings; this likely drew people who were more likely to believe in the outcome of the study; therefore, the study was marked as having detection bias. In the Galovski, et al., (2016) study, the experiment began with 92 participants but experienced a 45% drop out rate. Additionally, the therapists who performed the treatments were a part of the research team and were therefore inherently bias. The Devilly and Spence (1999) study recruited its participants through a radio announcement, publicity, and word of mouth. This innately drew people who believe in the positive outcome of the experiment. Additionally, 9 of the 32, or 28%, of the participants dropped out leading to attrition bias. Of the 23 participants who remained in the experiment, 43% were taking medications and seeking external psychiatric help for PTSD while a part of the study. Similarly, in the Devilly, Spence, and Rapee (1998) study, there were 51 participants at the first assessment of which 81% continued to take medications for PTSD, which would have an impact on the perceived effect of the treatments administered during the experiment. Additionally, of the 51 participants who started, only 35 were present at the posttreatment assessment, which resulted in a 34% drop out rate. In the Edmond, Rubin, and Wambach (1999) study, the participants were informed of the treatment group to which they were assigned after completing the pretest but before completing the posttest. In the Thunker and Pietrowsky (2012) study, the participants were recruited not only from the outpatient departs from a hospital but also through press and adverts at a university. Additionally,

participants were given a description of the study prior to being accepted. Many of the participants also were taking medication for their symptoms or external psychotherapy. In the study by Cook and her colleagues (2010), participants who started the experiment on medication that was previously assigned to them were also allowed to not only keep using the previously prescribed medication, but could also have their doses and medications changed throughout the study. Krakow and his research group (2001) clearly indicated that blinding of the participants and the personnel was not possible.

Statistical Analysis

Tables 7 and 8 show the raw data collected from the source studies for the experimental versus control analysis for the civilian and military populations separately and for the pre- versus posttreatment analysis.

Table 7

Raw Data from Source Studies Used in Control vs Experimental

	Control			Experimental		
Study	Mean	SD	Total	Mean	SD	Total
Military						
Cook 2010	74.85	19.52	63	74.04	20.36	61
Carlson 1998	38.7	16.2	12	35.2	22	10
Abramowitz 2008	47.8	3.1	15	42.3	2.9	17
Subtotal			90			88
Civilian						
Bryant 2003	28.00	15.31	18	19.15	11.12	20
Bryant 2005	10.88	8.27	33	10.83	10.16	30
Galovski 2016	57.75	14.8	56	54.81	20.5	52
Apostolo 2009	1.45	0.86	30	0.97	0.63	30
Krakow 2001	68.37	27.26	52	49.58	23.96	45
Edmond 1999	32.1	17	20	14.1	15.9	19
Barabasz 2013	59.66	17.1	18	24	7.52	18
Subtotal			227			214

Table 8

Raw Data from Source Studies Used in Pre- vs Posttreatment

	Pretreatment			Posttreatment		
Study	Mean	SD	Total	Mean	SD	Total
Military						
Abramowitz 2008	51.7	3.2	17	42.3	2.9	17
Carlson 1998	52.5	9	10	35.2	22	10
Cook 2010	81.34	14	61	74.04	20.36	61
Devilly 1998	48.36	11.1	11	35.64	21.66	11
Subtotal			99			99
Civilian						
Apostolo 2009	1.93	0.62	30	0.97	0.63	30
Barabasz 2013	77.11	8.1	18	24	7.52	18
Bryant 2003	32.50	8.71	20	19.15	11.12	20
Bryant 2005	25.74	8.41	30	10.83	10.16	30
Cusak 1999	2.27	0.59	27	1.33	0.87	27
Devilly 1999	28.18	14.25	11	18	15.94	19
Edmond 1999	38.7	16.4	19	14.1	15.9	19
Galovski 2016	72.48	15.01	52	54.81	20.05	52
Krakow 2001	81.88	16.96	45	49.58	23.96	45
Thunker 2012	26.85	11.82	61	24.16	13.35	61
Subtotal			313			313

The quantitative analysis was conducted using RevMan5, which took the data provided above and calculated a weighted value for each study based on the number of subjects in each study. It used the Inverse Variance statistical method to determine a standard mean difference for a 95% confidence interval. Table 9 provides the weight, range of the effect size, and the mean effect size of the source study for the pre vs post treatment study.

Table 9

Effect Size Analysis from Inverse Variance Method for Pre- vs Posttreatment

Study	Number of Subjects	Weight	Mean Effect Size	Effect Size Range
Military				
Abramowitz 2008	17	6.1%	3.01	[1.99, 4.02]
Carlson 1998	10	6.3%	0.99	[0.05, 1.93]
Cook 2010	61	8.4%	0.42	[0.06, 0.77]
Devilly 1998	11	6.6%	0.71	[-0.16, 1.58]
Subtotal	99	27.4%	1.22	[0.19, 2.25]
Civilian				
Apostolo 2009	30	7.7%	1.52	[0.94, 2.09]
Barabasz 2012	18	3.7%	6.64	[4.89, 8.40]
Bryant 2003	20	7.3%	1.31	[0.62, 2.00]
Bryant 2005	30	7.7%	1.58	[0.99, 2.16]
Cusak 1999	27	7.7%	1.25	[0.66, 1.83]
Devilly 1999	11	6.6%	0.65	[-0.21, 1.51]
Edmond 1999	19	7.2%	1.49	[0.76, 2.22]
Galovski 2016	52	8.2%	0.99	[0.58, 1.40]
Krakow 2001	45	8.1%	1.54	[1.07, 2.02]
Thunker 2012	61	8.4%	0.21	[-0.14, 0.57]
Subtotal	293	72.6%	1.45	[0.92, 1.98]
Total	**392**	**100.0%**	**1.38**	**[0.92, 1.82]**

Based on Table 9, it can be concluded that hypnosis was an effective treatment for PTSD since the total mean effect size was 1.38 with a 95% confidence interval. This value for the mean effect size corresponded to a *large* effect. More interestingly for the purpose of this study were the differences between the effect sizes of the military and civilian populations. The mean effect size of the military population was 1.22 while that for the civilian was 1.45. This suggested that the effect of hypnosis as a treatment for PTSD had a greater impact in civilian populations; however, this conclusion was offset by the difference in ranges. The range for the effect sizes in a military population was 0.19 to 2.25 whereas the range in the civilian populations was 0.92 to 1.98. The

difference in ranges suggested that some studies found the opposite effect. Specifically, that the military personnel experienced a much larger effect of the treatment than a civilian population would. An example of this potential conclusion could have been experienced in the study by Abramowitz, Barak, and Ben-Avi (2008). This was also supported by the overall effects, and the *p* values associated with them. The military population had an overall effect of 2.32 and a *p* value of 0.02, while the civilian population had an overall effect of 5.39 with a *p* value of less than 0.0001. The civilian population appeared to experience a greater effect from hypnosis; however, the civilian population analysis also presented with the heterogeneity effect while the military population was more homogenous.

Table 10 provides a summary of the test for heterogeneity and the overall effect. The τ^2 value provided a measure of the true variance among all the studies within that subgroup. χ^2 provided a statistical test for the significance of the heterogeneity. I^2 provided a relative scale for the true variance; less than 25% was considered low, a value between 25% and 50% was considered moderate, and a value higher than 75% was considered high.

Table 10

Results from the Heterogeneity Test and Overall Effect for Pre- vs Posttreatment

	Military Population	Civilian Population	Total
τ^2	0.93	0.59	0.58
χ^2	22.57	73.31	100.03
df	3	9	13
p	< 0.0001	< 0.00001	< 0.00001
I^2	87%	88%	87%
Z	2.32	5.39	6.08
P	0.02	<0.00001	< 0.00001

Table 10 shows that the heterogeneity was high for all the studies since the I^2 were higher than 75%, and the τ^2 values were relatively high. This was expected since the scales used in each of the studies was different and their numerical differences were significant. The χ^2 values were highly impacted by the number of studies. Since the number of source studies available for the subject matter were relatively few, the χ^2 values were not as impactful. In contrast, the I^2 value was independent of the number of studies. The results indicated that the inherent null hypothesis that there was homogeneity must be rejected especially, given the low *p* value. This supported the decision to use random effect analysis despite the wider confidence interval that it produced (Sedgwick, 2012).

The conventional statistical definition of an outlier is 1.5 multiplied by the interquartile range above or below the quartiles. The interquartile range in this case was considered to be the min and max ranges of the civilian populations' effect sizes, which were 0.92 and 1.98, respectively (Cohen, 1988). Based on this definition, any study that had a mean effect size higher than 3.57 or lower than -0.67 was considered an outlier.

The study by Barabasz (2013) fell within this definition, as its mean effect size was 6.64. In order to ensure that the results were not skewed by one study, the same statistical analysis as above was conducted without the outlier. Table 10 depicts the results.

Table 10 indicates that despite the removal of the source study with the outlying effect size, the overall effect size of 1.16 still corresponded to a *large* effect. However, without the outlier, the civilian mean effect size dropped to 1.16, which was less than that of the military population of 1.22. Additionally, with the removal of the outlier, the table clearly indicates the drop in the heterogeneity for the civilian population and the overall analysis.

Table 11

Effect Size Comparison With- and Without Barabasz and Barabaz (2013)

	With Outlier	Without Outlier
Military Subtotal		
Weight	27.4%	27.4%
Mean effect size	1.22	1.22
Effect size range	[0.19, 2.25]	[0.19, 2.25]
τ^2	0.93	0.93
χ^2	22.57	22.57
df	3	3
p	< 0.0001	< 0.0001
I^2	87%	79%
Z	2.32	2.32
P	0.02	0.02
Civilian Subtotal		
Weight	72.6%	72.6%
Mean effect size	1.38	1.16
Effect size range	[0.92, 1.98]	[0.78, 1.54]
τ^2	0.59	0.25
χ^2	73.31	34.37
df	9	8
p	< 0.00001	< 0.00001
I^2	88%	77%
Z	5.39	5.99
P	<0.00001	< 0.00001
Total		
Mean effect size	1.38	1.16
Effect size range	[0.93, 1.82]	[0.80, 1.51]
τ^2	0.58	0.32
χ^2	100.03	59.91
df	13	12
p	< 0.00001	< 0.00001
I^2	87%	80%
Z	6.08	6.34
P	< 0.00001	< 0.00001

Table 12 provides the weight, range of the effect size, and the mean effect size of the source study for the control versus experimental treatments. Similar to the pre- versus posttreatment analysis, Table 12 suggests that hypnosis was an effective treatment for PTSD since the mean effect size was 0.71 with a 95% confidence interval. This value for the mean effect size corresponded to a *medium* effect. The pre- versus posttreatment was expected to have a higher effect than a control versus experimental treatment. In the first instance, there was a direct analysis of the actual effect of the treatment. In the second experiment, the participants in the study would have been divided between a control and an experimental group. Even if the control group received no official treatment, both the placebo effect and the passing of time would have reduced the perceived effect of the treatment. Additionally, some studies used symptom control as a treatment method for the control group since the subjects were humans who were experiencing PTSD symptoms. This is a possible explanation for the difference between the high mean effect size of the pre- versus posttreatment and the medium mean effect size of the control versus experimental treatment. Similar to the pre- versus posttreatment analysis, the control versus experimental treatment also depicted a higher mean effect size for the civilian population, 0.75, compared to that of the military, 0.63. The ranges of the effect sizes also seemed to provide a similar conclusion to the pre- versus posttreatment above. The range for the civilian population was 0.28 to 1.22 compared to that of the military population, which was -0.40 to 1.66. The higher range of the military population once

again suggested that some authors would have had the conclusion that a military personnel member would have experienced a higher effect than a civilian.

Table 12

Effect Size from Inverse Variance Method for Control vs Experimental Treatment

Study	Control N	Experimental N	Weight	Mean Effect Size	Effect Size Range
Military					
Abramowitz 2008	15	17	8.3%	1.79	[0.95, 2.63]
Carlson 1998	12	10	8.3%	0.18	[-0.66, 1.02]
Cook 2010	63	61	11.9%	0.04	[-0.31, 0.39]
Subtotal	90	88	28.4%	0.63	[-0.40, 1.66]
Civilian					
Barabasz 2013	18	18	7.7%	2.64	[1.72, 3.56]
Edmond 1999	20	19	9.5%	1.07	[0.39, 1.75]
Krakow 2001	52	45	11.5%	0.72	[0.31, 1.14]
Bryant 2003	18	20	9.7%	0.65	[-0.00, 1.31]
Apostolo 2009	30	30	10.7%	0.63	[0.11, 1.15]
Galovski 2016	56	52	11.7%	0.16	[-0.21, 0.54]
Bryant 2005	33	30	10.9%	0.01	[-0.49, 0.50]
Subtotal	227	214	71.6%	0.75	[0.28, 1.22]
Total	**317**	**302**	**100.0**	**0.71**	**[0.31, 1.11]**

Table 13 provides a summary of the heterogeneity test and the overall effect for the control versus experimental treatment group. As expected, the random effect in combination with the fewer available studies for the control vs experimental treatment analysis produced higher heterogeneity among the studies. As in the previous analysis, the high I^2 value justified the use of the random effect and the inherent null hypothesis that there was homogeneity had to be rejected. The total effect was still higher for the civilian population compared to the military population.

Table 13

Results from the Heterogeneity Test and Overall Effect for Control vs Experimental

	Military Population	Civilian Population	Total
τ^2	0.70	0.31	0.32
χ^2	14.32	31.65	48.17
df	2	6	9
p	0.0008	<0.00001	<0.00001
I^2	86%	81%	81%
Z	1.20	3.15	3.47
P	0.23	0.002	0.0005

The quantitative analysis above provided answers to two of the research questions. The first research question asked for the ranges of effective sizes, including 95% confidence intervals, for hypnosis as a treatment for military personnel and civilians suffering from PTSD. The ranges differed between the pre- versus posttreatment and experimental versus control treatments; however, in both cases, both the null and alternate hypotheses were invalid in the studies in which the outlier was not excluded. The ranges of the effect size for the civilian population were 1.06 in the pre- versus posttreatment with the outlier, 0.76 without the outlier, and 0.94 for the control versus experimental treatment. The ranges of the effect size for the military populations were 2.06 in the pre- versus posttreatment and 2.06 in the control versus experimental. In all of these cases, the ranges were greater than 0.2, which invalidated the null hypothesis, and were greater than 0.8 for the pre- versus posttreatment with the outlier and the control versus experimental treatments, which invalidated the alternative hypothesis. In the case in which the outlier created by the Barabasz and Barabasz (2013) study was removed, the

range of the effect sizes decreased to 0.76 thereby causing a rejection of the null hypothesis and an acceptance of the alternative hypothesis.

The second research question asked for the mean effect size for using hypnosis as a treatment for PTSD in military and civilian personnel including a 95% confidence interval. The quantitative analysis led to the rejection of the null hypothesis and acceptance of the alternative hypothesis. The effect sizes are listed in Tables 8, 9, 11, and 12, but they were all greater than 0.5, which was the threshold between the two hypotheses. Figures 2 and 3 depicts the forest plots for the pre- versus posttreatment analysis with and without the outlier. Figure 4 depicts the forest plot for the control versus experimental treatment analysis.

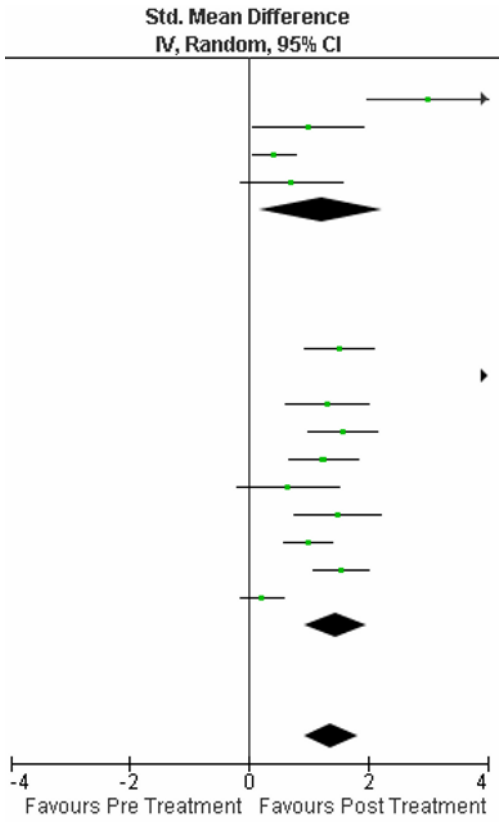

Figure 2. Forest plot for pre- versus posttreatment with the outlier.

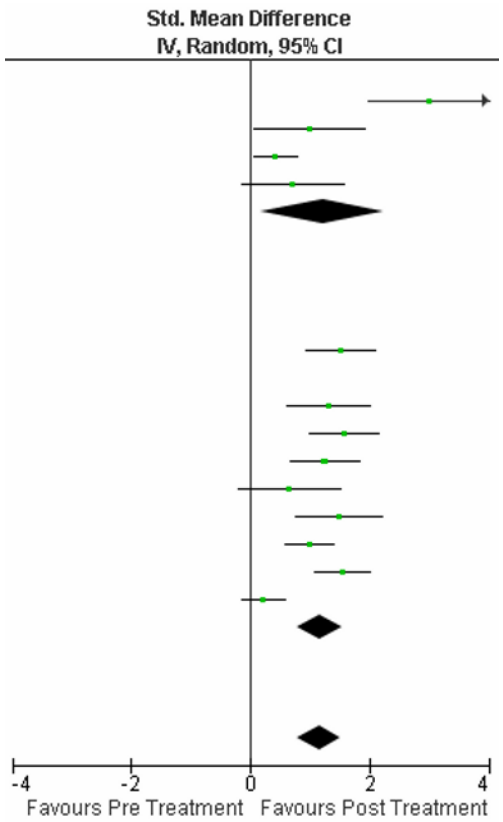

Figure 3. Forest plot for pre- versus posttreatment without the outlier.

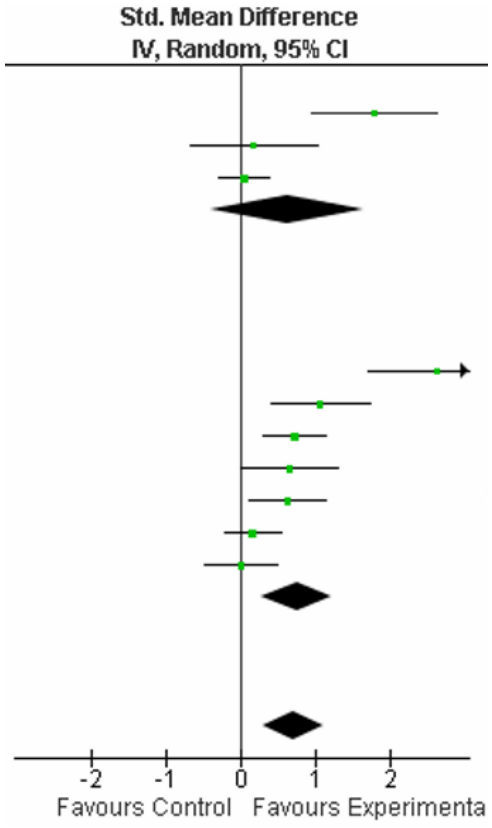

Figure 4. Forest plot for control versus experimental.

The bias analysis for the data was conducted through RevMan5. Each of the source studies was thoroughly analyzed for any possible bias. The funnel plots that resulted from this analysis are presented in Figures 5 and 6. Both of the funnel plots do not show clear symmetry. This was expected since the heterogeneity test also concluded that the analysis was not homogenous for either of the outcomes. The asymmetry and heterogeneity within these studies was predictable since the studies had vastly varying methodologies in that they used different measures, different lengths of treatment, different controls, and often allowed patients to maintain external treatments. Each of these introduced a significant amount of variety within the biases and the outcomes. Since neither of these two plots is heavily skewed in one direction, it was unlikely that the heterogeneity was a cause of reporting bias.

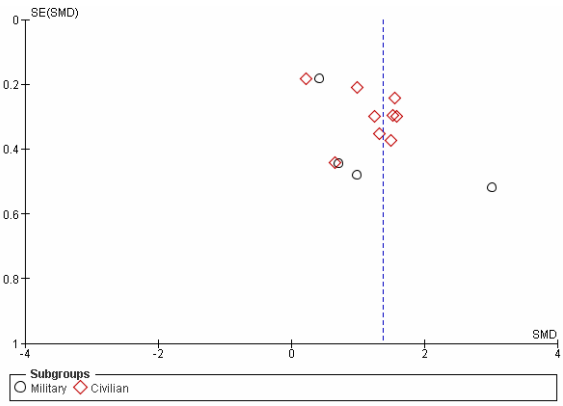

Figure 5. Funnel plot for the pre- vs posttreatment analysis.

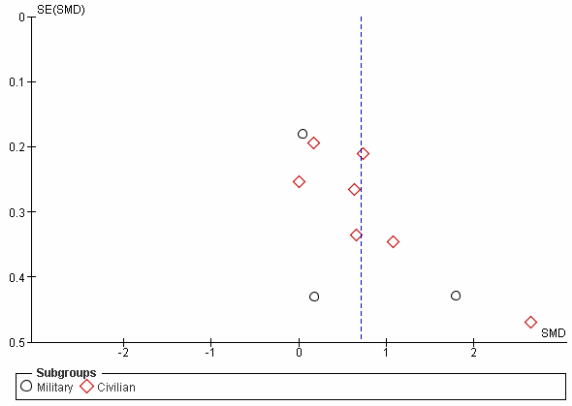

Figure 6. Funnel plot for the control vs experimental treatment analysis.

To determine whether the combination of CBT and hypnosis produced a difference in the effect size, a fixed-effect quantitative analysis was conducted since the number of studies available were fewer. The studies included were limited to only ones that used the CAPS scale, as the only two studies which did a direct comparison between

hypnosis and hypnosis with CBT used the CAPS scale. Table 14 depicts the raw data of the studies included in the analysis.

Table 14

Raw Data for Studies Involved in the Hypnosis vs Hypnosis with CBT

	Pretreatment			Posttreatment		
Study	Mean	SD	Total	Mean	SD	Total
Hypnosis						
Galovski 2016	72.48	15.01	52	54.81	20.05	52
Krakow 2001	81.88	16.96	45	49.58	23.96	45
Subtotal			97			97
Hypnosis with CBT						
Bryant 2003	32.7	7.51	20	15.9	13.36	20
Bryant 2005	25.74	8.41	30	10.83	10.16	30
Subtotal			30			30

Based on the raw data in Table 14, Table 15 was created for the fixed-effect inverse variance analysis to get the effect size and the effect size ranges. Based on this table, it was clear that the mean effect size for the hypnosis with CBT was higher than the effect size for treatments that used only hypnosis suggesting a slightly greater effect in the treatment of PTSD with both CBT and hypnosis. The range for the hypnosis with CBT had a larger effect size, 1.17, compared to the one which used only hypnosis, 0.62. Both the hypnosis and the hypnosis with CBT showed improved results after the treatment. The heterogeneity test results for this analysis are presented in Table 16.

Table 15

Effect Size Analysis from Inverse Variance Analysis for Hypnosis vs Hypnosis with CBT

Study	Number of Subjects	Weight	Mean Effect Size	Effect Size Range
Hypnosis				
Galovski 2016	52	39.1%	0.99	[0.58, 1.40]
Krakow 2001	45	29.1%	1.54	[1.07, 2.02]
Subtotal	97	68.1%	1.23	[0.92, 1.54]
Hypnosis with CBT				
Bryant 2003	20	12.8%	1.52	[0.81, 2.23]
Bryant 2005	30	19.1%	1.58	[0.99, 2.16]
Subtotal	30	31.9%	1.58	[0.99, 2.16]
Total	127	100.0%	1.30	[1.03, 1.58]

Table 16

Results from Heterogeneity Test and Overall Effect for Control vs Experimental

	Hypnosis	Hypnosis with CBT	Total
χ^2	3.00	0.02	4.40
df	1	1	3
p	0.08	0.90	0.22
I^2	67%	0%	32%
Z	7.78	6.74	10.23
P	<0.00001	<0.00001	<0.00001

While the I^2 values were above 50% for the analysis on treatments using only hypnosis initially suggesting that the test does not meet homogeneity, the *p* value was high suggesting that the results were not statistically significant; therefore, the fixed effect analysis was retained. In contrast, the I^2 value for both the analysis of the treatments with both hypnosis and CBT and for the total analysis were both well below the 50% suggesting that the inherent null hypothesis of a homogeneity could be accepted. This

was further emphasized by the clear symmetry in the funnel plot for the above analysis, which is presented in Figure 7.

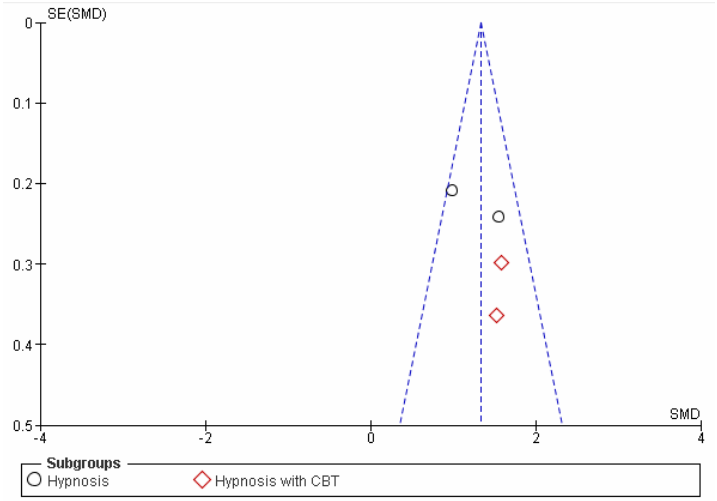

Figure 7. Funnel plot for the analysis on the treatments of hypnosis compared to hypnosis with CBT.

Conclusion

The meta-analysis produced a random effect quantitative study of the differences in effect sizes between military and civilian personnel. Based on both the pre- versus posttreatment and control versus experimental treatment analyses, it was determined that the civilian personnel population achieved a higher effect size. The pre- versus posttreatment analyses produced higher effect sizes compared to the control versus experimental treatment analyses as was expected. Both sets of statistical studies had high heterogeneity likely due to the differences in methodologies used among the source studies as well as the vast difference in the measures and biases. Despite this, an outlier was still present in the pre- versus posttreatment analysis, which helped skew the results pulling the effect size higher. Once it was removed, the military population exhibited a

higher effect size. In the fixed effect analysis of the standalone treatment for hypnosis compared to the treatment of PTSD with hypnosis and CBT, the effect size for the latter subgroup was slightly higher. Overall, all the effect sizes were positive suggesting that hypnotherapy is effective as a treatment for PTSD. Chapter 5 provides a further discussion on the results produced by the quantitative analysis and relates the conclusion in the meta-analysis to the currently available research.

Chapter 5: Discussion and Recommendations

Introduction

The results from this meta-analysis confirmed the findings of other researchers that hypnosis is a viable treatment for PTSD (Barabasz & Barabasz, 2013; O'Toole et al., 2016).; Rotaru, 2016; Wickramasekera, 2015). However, the purpose of this meta-analysis was to provide characteristics of patients and situations for which hypnosis proved to be an effective treatment. This purpose was determined from the need to remove the taboo of using hypnosis as a viable treatment by providing evidence-based guidelines on when its use would be most effective. The total source studies used in the primary research were 14, which included 697 total participants. In the military subgroup, there were 201 participants from four studies, and in the civilian subgroup, there were 496 participants from 10 studies. One of the studies from the civilian subgroups was determined to be an outlier because it featured 36 participants and used a different scale, leading its effect size to fall into the definition of an outlier. While the overall conclusion on the efficacy of hypnosis did not change based on the inclusion of the outlier, the effectiveness between the military and civilian groups was made more inconclusive.

In addition to a discussion of the results, Chapter 5 offers a discussion on the large heterogeneity effect experienced in all of the quantitative analyses conducted as a part of this study. Additionally, effort will be spent to clearly discuss the biases as well as the limitations of the study in order to provide a perspective and remark on the strength of the results. Finally, this meta-analysis clearly indicates areas in which further research is needed and some overall implications of hypnosis as a treatment for PTSD both in the

professional field of psychology as well as the consequences the results have on the potential for positive social change.

Interpretation of the Findings

The purpose of the meta-analysis was to reach a conclusion on the specific situations and characteristics for which hypnosis is an effective treatment method for PTSD. The generalization of the conclusions has limitations integrated in the design of the meta-analysis. The direct results were based on three independent studies that were a part of the meta-analysis and included comparisons of the control and experimental results of research studies of military and civilian personnel, the pretreatment and posttreatment results of research studies of military and civilian personnel, and hypnosis versus hypnosis with CBT results of currently available research studies. The purpose of conducting separate analyses between the control versus experimental and the pre- versus posttreatment studies was to provide some level of redundancy because the number of available source studies were relatively low. Multiple databases were used to find source studies to be used in the meta-analysis; however, only a few met the predefined inclusion criteria. The possibility exists that additional studies were available that were not found despite the extensive search.

The interpretation of the effect sizes presented was also taken with consideration toward the heterogeneity. Overall, most of the studies used a wide range of measurements with vastly spanning scales. Additionally, while all of them used a form of hypnotherapy as the treatment, the exact treatment method and the duration of treatments varied highly. This forced the quantitative analysis to be based on a random-effect model, which

inherently introduced more heterogeneity and weakened the overall results. A separate analysis was conducted into the bias present in each of the studies, but no overall risk of reporting bias was found as depicted based on the funnel plot in Figures 5, 6, and 7.

Overall Findings

The overall conclusion from each of the three quantitative analyses produced the same results regarding the general effectiveness of hypnotherapy as a treatment of PTSD that are available in previously conducted meta-analyses (O'Toole, et al., 2016; Rotaru, 2016). The total standard mean differences provided by the two analyses in this study were 1.38 for the pre- versus posttreatment analysis and 0.71 for the control versus experimental treatment analysis. The positive value indicated the trend favoring the effectiveness of hypnosis as a treatment for PTSD. The meta-analysis conducted by Rotaru (2016) indicated a standard mean difference of 1.172, which provided similar overall results. Rotaru's study featured fewer source studies, a lower sample size and used a fixed-effect model for the analyses; it also experienced high heterogeneity. Because the analyses conducted in this research had a greater number of source studies with varying measures, the χ^2 value was expectedly larger compared to the one in Rotaru's analysis.

The meta-analysis conducted by O'Toole, et al. (2016) had a standard mean difference of -1.18. Their study was conducted on the effect of the symptoms from PTSD before and after a treatment using hypnotherapy. The negative value in this study, therefore, reached the same conclusion, since a decrease in the symptoms experienced by the participants also confirms an effectiveness of hypnosis as a treatment of PTSD.

Similar to the analyses conducted in this study, O'Toole, et al. experienced high heterogeneity and used a random effects model. The $\chi 2$ value in the heterogeneity test was higher in the analyses of this study compared to the one of O'Toole, et al. The result stemmed from the larger number of source studies with a greater variety in their measures and treatment methods.

The above comparisons with the findings from current literature serve two purposes. First, they confirm the general conclusion that hypnotherapy is an effective treatment for PTSD. While this is not a new conclusion, it remains highly valuable. The quality of life of patients suffering from PTSD is severely degraded by traumatic memories which can cause severe, irrational, and unintentional responses to stimuli present in everyday experiences (Qi, et al., 2016). The constant reliving of those memories through flashbacks and nightmares is sufficient reason to need to expand the currently available treatment methods. While there are psychopharmacological solutions to PTSD, a study conducted by Van Etten and Taylor (1998) concluded that psychological therapies had a significantly lower dropout rate and higher effectiveness in symptom reduction compared to psychopharmacological therapies. While the pharmacological developments in the last 20 years have likely improved the effectiveness of the symptom suppression, the focus of this treatment is not to deal with the inherent problem but rather to suppress the symptoms.

This problem is similar to the one inherent in the CBT, which also seeks to reduce the responses to stimuli from the trauma. Barabasz and Barabasz (2013) summarized that the effects of trauma are integrated into the amygdala and hippocampus, which are

responsible for emotions, memory, and the autonomic nervous systems. These are difficult to access through conscious thought, thereby making CBT more an active suppression of the responses and symptoms of PTSD rather than a treatment of the source problem. Through the relaxed state of consciousness and enhanced suggestibility, hypnosis is more likely to be able to access the traumatic memory and allow the mind to redefine it as something that simply happened in the past.

The difference between resolving the inherent problem of the traumatic memory and allowing the conscious mind to repress and deal with the symptoms is most evident in the comparison between CBT and hypnosis along with the combination of the two treatments. Bryant, et al., (2003, 2005) conducted two studies on the difference in the effectiveness between a treatment of CBT for PTSD compared to CBT with hypnosis. A smaller scale study was also conducted by Abramowitz and Lichtensberg (2010), demonstrating successful treatments of PTSD using a combination of CBT and hypnosis. In this meta-analysis, difference in effectiveness were analyzed to compare a treatment of just hypnosis and one of hypnosis and CBT was analyzed. Both the study by Bryant, et al., and this meta-analysis concluded the same effect: A treatment of hypnosis in combination with CBT offers the most effective treatment results. One treats the underlying cause of PTSD, while the other helps prevent the symptoms; overall, the quality of life of the patient is significantly improved by the treatment, both in terms of the reduced symptoms experienced as well as by the reduction of the traumatic experience.

The comparatively larger number of source studies included in the meta-analysis allows for some comments to be made about the effect of the duration of the study on the effectiveness of the treatment. The treatments themselves varied vastly, and therefore, a direct comparison would not have resulted in any valuable conclusive results; however, observations can be made on the overall trends. Most of the studies featured between two and eight treatment sessions of a 90-minute duration. The shortest treatment was two sessions of 1.5 hours each, while the longest were either the eight sessions of 90 minutes or 12 sessions of 60 to 75 minutes. The results varied based on the measure used to determine the effect of the treatment.

IES and CAPS were the two most popular scales; therefore, a comparison between the two was conducted. comparison. Among the studies that used the IES scale, there was a clear overall trend that studies with a longer duration experienced better overall results; however, in the studies that used the CAPS scale, there was no clear trend between the duration and the reduction in the effectiveness of the treatment. These two differences highlight the effects of the scales. The IES scale is self-reported and is a measure of the distress caused by traumatic events (Weiss & Marmar, 1996). Whereas the CAPS is a more standardized, diagnostic method that measures not only the current effects of PTSD but also the symptoms from the past week (Blake, Weathers, Nagy, Kaloupek, Gusman, Charney, & Keane, 1995). The effect of the duration of treatment is much more likely to be evident in a scale that examines only the currently experienced symptoms rather than the overall effects of the trauma.

Subgroup Analyses

The more interesting conclusions from this study come from the analyses of the two subgroups: military and civilian populations. Clear differences in the populations and the sources of trauma were exhibited in the division of these two subgroups. Military members are taught to be obedient to sources of authority, such as a superior, a doctor, or a psychologist (Eads & Wark, 2015). Additionally, they are exposed to much more traumatizing events and are taught to some extent to become numb to the aggression, destruction, and mortality present in the war/combat environment. In contrast, civilians have a much wider range of personalities, which include some who are inherently distrustful of authority figures (Eads & Wark, 2015). The sources of civilian traumas also have a significantly greater diversity because experiences that would be commonplace for some soldiers would be traumatizing for unprepared civilians, while civilians still experience death and violence, which could be traumatizing to members of both populations.

In examining the outcomes offered by the pre- versus posttreatment analysis compared to the control versus experimental analysis, there appeared to be a direct conflict in the overall results. Once the outlier is removed, the pre- versus posttreatment analysis indicated that the civilian population experienced a greater effect of hypnotherapy as a treatment of PTSD compared to the military population. In contrast, the control versus experimental analysis indicated that the military population experienced a greater effect. The control versus experimental analysis can be considered inconclusive in providing results in comparisons between the military and civilian

populations since the statistical analysis of the military population indicated an overall effect, *Z* value, whose *p* value was greater than 0.02. This makes the result not statistically significant providing no conclusive results. Therefore, the discussion will focus on the more conservative results and take the outcomes offered by the pre- versus posttreatment group to be of greater significance.

As a treatment of PTSD, hypnotherapy is a guided process through which participants can redefine the traumatic event (Abramowitz & Lichtenberg, 2010). This process significantly relies on the trust between the client and the psychologist (Kaklauskas & Clements, 2016). Since military personnel have more respect toward authority and are more experienced in taking orders, the process of guiding the client is so typical that it becomes more natural. Patients with a military background may be more likely to inherently believe in the abilities of the psychologist and to listen to the guidance provided by the authority figure. This conclusion is also shared by Eads and Wark (2015) who suggest that military personnel would be more easily put into a hypnotic trance. Further, the researchers reported that since military personnel already have experience in becoming desensitized to violence, they are more likely to be able to do the same for their own traumatic experience in the state of heightened suggestibility offered by hypnotherapy through the directive of the psychologist. This conclusion is a more generalized form of the case study conducted by Moss (2017) in which hypnosis was applied as a treatment for PTSD for a soldier, who upon returning from Iraq, suffered the death of peers amplifying the PTSD symptoms. The events that would traumatize a member of the military are more uniform compared to those that would traumatize a

civilian. This allows a psychologist to be more experienced in performing hypnosis as a treatment method for PTSD for specific trauma sources. Inherently, this experience makes a method that relies on guidance more likely to succeed because psychologists can more directly apply the same principles across more patients. Finally, the military forces people to learn responsibility and to stick to a schedule or a set of instructions. This responsibility helps with the success of treatments using hypnosis because it allows multiple sessions with a smaller dropout rate. This was confirmed by the lower attrition bias experienced in the studies involving military populations compared to the studies involving civilian populations.

One interesting effect can be learned by examination of the biases involved in the two different analyses. Most of the studies which involved military personnel received their participants through VA or through referral from mental health treatment facilities. In contrast, a number of the civilian studies received their participants through media ads requesting volunteers. Few of these studies were also able to create blinded experiments. Through this method of recruiting participants, some inherent selection bias was introduced. People who believed in the effects of hypnotherapy would have been more likely to sign up for the study compared to those who did not believe in its effects. This would have inherently predisposed the civilian population to be more responsive to the treatment method. In the initial analysis, the overall effect, provided by the *Z* value, of the civilian population was almost double that of the military population. Both results were statistically significant to a 95% confidence interval. Based on the analysis of the biases, one can reach the conclusion that being predisposed to the idea of the treatment working

makes it more likely that the treatment will indeed improve the patient's condition. The bias was more distinguishable in the pre- versus posttreatment analysis, as it had three more civilian studies, which involved almost 70 more participants compared to the control versus experimental treatment. This is not a new discovery; however, it does mean that psychologists considering hypnosis as a treatment for a particular patient should actively take into consideration the patient's openness to hypnosis. An example of this was found in a patient who displayed overly aggressive behavior in addition to the PTSD symptoms. He was enrolled in multiple treatments, but was uncooperative and found little improvement to his symptoms. Later, when a therapist described hypnosis and placed him under the state of heightened suggestibility, he was able to find relief (Eads & Wark, 2015).

Limitations of the Study

There are innate limitations in any meta-analysis that stem from the analytical process and the decisions made by the researcher. Specifically, there is a great dependency on the selected source studies. While there was great care placed in attempting to examine all relevant studies, the researcher was limited to using only electronically published results in English from databases available to the Walden University Library and Google Scholars. Despite the careful search, the researcher cannot claim to have created an absolutely exhaustive list of relevant studies. Additionally, there is inherent publication bias since studies with negative results are less likely to be published despite the funnel plot in Figure 5, 6, and 7 indicating that there was no significant effect from it. This type of bias does not have a great effect on the comparison

between the civilian and military populations, but it can impact the overall analysis of the effectiveness of hypnosis as a treatment for PTSD.

The criteria for selecting the source studies for the meta-analysis were determined before the list of relevant research was compiled to improve the data quality and strengthen the validity of the results. However, the selection of the criteria was determined by a single researcher, and therefore, applies his understanding of the important characteristics for a strong quantitative analysis. Since there was limited quantitative research available on the topic which was further limited by a need to compare military and civilian populations, some criteria that would have decreased the heterogeneity of the results were considered but not selected. An example of this was the allowance of studies with a variety of measures, as long as the scale used was a direct assessment of the effects of PTSD. Using solely studies with a single measure would have resulted in significantly more homogeneity; however, the currently available research simply did not permit this criterion. Similarly, a strength of hypnotherapy as a treatment is the variety in the method afforded to the psychologist to morph the treatment into the most ideal for a specific patient. While the method was standardized within each of the studies, the diversity in the methods among studies provided a large source of the heterogeneity.

Generalizability

The overall result that hypnosis can be an effective treatment method for PTSD can be considered applicable to the general population. Despite the differences in scales,

treatment duration, method, and population, the analyses consistently concluded a positive effectiveness. The characteristics of the source trauma and the individuals for whom hypnosis would likely lead to a successful treatment of PTSD is highly applicable to the overall treatment of PTSD. As this is a treatment method that has proven to be effective but does not get much application, reducing the scope of patients to a subset who are more likely to find it successful should provide a more directed approach for assigning it as a treatment. The conclusion that treatments involving hypnosis in combination with CBT offers much more efficient results was independent of the statistical analytical method and was independent of the population; therefore, that is a valuable directive for psychologists considering either a treatment method of hypnotherapy or CBT.

Validity

The meta-analysis consistently indicated high degrees of heterogeneity. The primary sources for this were the diversity in measures, which required the use of a random effect model. A subtle source of heterogeneity was also the hypnosis treatment, which varied both in the methods applied and the duration. Despite the statistical significance of the results, a source study selection which would have led to more homogeneous results would have increased the validity of the results. If there were sufficient currently available research data to allow for the standardization of a measure and a more well-defined hypnotherapy method to be selected as criteria, then the study would have used a fixed effect model, and the homogeneity test would have passed. This

does not invalidate the meta-analysis in its current state since even with the heterogeneity, the results were assessed to be statistically significant.

Reliability

The reliability of the study stems from the source study selection and careful statistical analysis. Each subgroup required a sufficient number of high quality source studies in order to produce statistically significant results. This involved an extensive research process through multiple databases and careful selection of criteria. Once the studies were selected, the statistical analysis portion was repeated through multiple methods to enhance reliability of the results. Any differences were documented and carefully investigated. There are hypothetically possible improvements in the study especially once more source research becomes available which would strengthen the reliability of the study; however, with the currently available source research and the scope of the meta-analysis, the results are believed to be reliable.

Recommendations

The meta-analysis reached its goal of verifying the effectiveness of hypnotherapy as a treatment of PTSD, providing guiding characteristics for patients and trauma for successful treatment, and investigating the effects of some of the common moderator variables. The results are expected to provide strength to the popularization of hypnosis as a potential treatment method for PTSD. As with any study, however, answering a set of questions creates a new set of research inquiries that are believed to offer significant insight.

Future Research

While there is substantial research into hypnosis as a treatment method for PTSD, a sizeable amount of it is in the form of case studies. These studies span the ranges of traumas in military and civilian members. For example, Rocha and Tellez (2016) described a case study of a patient who suffered from kidnapping and rape; Watkins (2000) detailed a study of a soldier who had PTSD before entering service from an abusive childhood; and finally, Serpers, et al., (2016) described a case study of two young children who acquired PTSD symptoms after a difficult medical procedure. However, while case studies can demonstrate that a treatment method works for specific individuals, large-scale studies are needed to understand the full effectiveness of any treatment. Therefore, a fundamental recommendation would be to develop a large sample-sized, blinded study with a standardized treatment method that involves a control group and applies a number of measures. This study should be repeated for both military and civilian populations before a similar assessment to the one in this meta-analysis is conducted. The aim of this would be to reduce the heterogeneity.

Based on the analysis, several tangential studies can be proposed. Much of the currently available research is based on broadly categorized traumas. Currently available research, specifically into military members, usually does not differentiate among sources of the trauma. An example of this is the study conducted by Devilly, Spence, and Rapee (1999) which groups together all veterans. This could contradict the PTSD source analysis conducted by Watkins (2000) demonstrating that some soldiers' trauma was from before they entered the military. It would be highly valuable to create a study that would analyze the results of hypnosis as a treatment based on the source of the trauma.

For example, would a trauma that stems from sexual violence be more effectively treated by hypnotherapy compared to one that stems from the death of a relative or a friend? Answers to analysis comparing the effectiveness to the source of the trauma would provide further guidelines for cases in which hypnotherapy is the most ideal treatment method. Producing this set of guidelines from evidence-based research is the most likely process to successfully integrate hypnotherapy into the commonly assessed treatment methods for PTSD.

In addition to developing a set of guidelines for ideal cases, another area lacking in direct research is the hypnotherapy method applied. The treatment method is broad and allows for customized treatments for every individual as detailed by O'Toole, et al., (2016). While that is a leading strength of the method, it makes its application and consequently its results much more difficult to reproduce. Developing studies which are able to test individual components of currently applied methods would provide a better understanding of hypnosis as a treatment, but it will also provide more confidence in the community of psychologists regarding its effectiveness.

Implications

The large number of individuals suffering from PTSD who go through various treatment methods that only treat the disorder's symptoms or the responses to stimuli indicates a need for a more diverse pool of methods with better guidelines into the most appropriate method for each case. This study sought to provide exactly that by assessing a treatment method often considered unconventional almost to the extent of taboo. The results concluded that hypnotherapy is an effective treatment method. This is a conclusion reached by a number of other research papers some of which are case studies, such as those by Eads and Wark (2015), and others are large scale, controlled experiments, such as those by Barabasz and Christensen (2013); however, the publication of all of these studies has not produced a significant shift in the overall perspective of the psychotherapist community regarding its use. The lack of a clear conclusion of the physiological effects of hypnotherapy on the human brain combined with the vast diversity in its application understandably make the method less intuitive and make its practicality harder to perceive. By providing a clear set of guidelines for the characteristics of the patients and the source of the trauma that would lead to successful treatment of PTSD with hypnosis, the author hopes to make the process more intuitive and accessible.

Implications for Positive Social Change

Increasing the number of available treatment methods for any mental disorder can be considered a positive influence on the practical use of psychology since it will provide more options to professionals trying to treat very diverse individuals. Hypnosis is a

unique method in its ability to provide a flexible approach which is heavily tuned for each individual. The popularization of this treatment is likely to induce a positive social change because it will hopefully reduce the treatment duration and the relapsing for individuals with PTSD. This disorder has a high relapse rate and many of the individuals who relapse, especially more than once, are likely to turn to self-medication or self-harm in an attempt to deal with the symptoms. By reducing the duration of the treatment, this could motivate more people to seek professional help for this and other mental disorders.

Because individuals who suffer from a mental disorder also impact those around them, the improved treatment process will also improve the quality of life of those around the patients. There is also an indirect burden on the community; since the patient cannot contribute in a positive way and causes increased stress in the immediate family, the overall stress level of everyone in the community will increase. This is not even considering that many who suffer from mental illnesses become homeless and develop antisocial behavior. Reducing the duration and resources required by treatments and reducing the medication prescribed for mental illnesses could make treatments more accessible. Subsequently, the reduced medication prescriptions could also reduce addictions.

Finally, by increasing the application of the treatment method, a greater understanding of its effects can provide further insight for the research community. This can lead to the use of hypnosis in the treatment of other disorders, which would bring similar benefits to other aspects in the treatment of mental health.

Conclusion

Through the currently available published research and the exploration conducted in this meta-analysis, the conclusion that hypnosis is an effective treatment for PTSD is upheld and specific guidelines for its use are provided. As can be expected, the variety of personalities and experiences found in individuals understandably predisposes some people to undergo induction with more ease and increase their likelihood of reaching faster results from the treatment. These guidelines will hopefully increase the confidence in the treatment method which will allow more psychologists to approach it as any other tool in their daily practice. The growth of the practice would lend more case studies and further research which will ultimately allow a new perspective on the field. The new perspective will allow the development of new questions and new topics for exploration.

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Addendum 1: Definitions of acronyms and abbreviations

SSRI	Selective Serotonin Re-uptake Inhibitor Antidepressants
PDI	Posttraumatic Diagnostic Scale
IES	Impact of Events Scale
BDI	Beck Depression Inventory
df	Degrees of Freedom
PICS	Psychiatric Impatients Comfort Scale
DASS-21	Depression, Anxiety and Stress Scale
CPT	Cognitive Processing Therapy
CAPS	Clinician-administered PTSD Scale
PSQI	Pittsburgh Sleep Quality Index
SCL-90	Symptom Checklist 90
PCL	PTSD Checklist
SUDS	Subjective Units of Discomfort Scale
SPS	Stancard Psychiatric Support
BAI	Beck Anxiety Inventory
STAI	Speilberger State-Trait Anxiety Inventory
SI_PTSD	Structured Interview for Posttraumatic Stress Disorder
BASA	Behavioral Assessment of Speech Anxiety
DAST	Drug Abuse Screening Test
VOC	Validity of Cognition
PPD	Personal Problem Definition Questionnaire
CMS	Civilian Mississippi Scale for PTSD
PSS-SR	PTSD Symptom Scale-Self Report
PTSD-I	PTSD Interview
CEQ	Credibility/Expectancy Questionnaire
DEVS-T	Distress Evaluation Scale for Treatment
BI	Brief Inventory
PDS	Posttraumatic diagnostic scale
RCC	Routine Clinical Care
SNM	Sleep and Nightmare Management
CCQ	Catastrophic Cognitions Questionnaire
SC	Supportive counseling