A Meta-Analysis of Group Treatment Outcomes for Veterans with Substance Use Disorders

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A META-ANALYSIS OF GROUP TREATMENT OUTCOMES
FOR VETERANS WITH SUBSTANCE USE DISORDERS

by

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B.S. December 2013, Old Dominion University
M.S. May 2016, Old Dominion University

A Dissertation Submitted to the Faculty of
Old Dominion University in Partial Fulfillment of the
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ABSTRACT

A META-ANALYSIS OF GROUP TREATMENT OUTCOMES FOR VETERANS WITH SUBSTANCE USE DISORDERS

Robert “Tony” Dice
Old Dominion University, 2020
Chair: Dr. Nina Brown

Group therapy is commonly used in the treatment of substance use disorders (SUD). Many studies exist related to the efficacy of group interventions for veterans with SUDs. A meta-analysis and systematic review of the literature addressing the use of group therapy, specifically psychoeducational groups, cognitive behavioral therapy (CBT) groups and support groups, in the treatment of SUDs with veterans was conducted. The following questions guided the research:

What are viable treatment outcomes for psychoeducational, CBT, and support groups of veterans with SUDs? and What are the measures that capture outcomes related to psychoeducational, CBT, and support groups of veterans with SUDs? The systematic review revealed three themes addressing 1) group types utilized, 2) level of exposure to groups, and 3) types of substances being addressed. The meta-analysis indicated that CBT groups produced the greatest increase in percentage of days abstinent (PDA) and Twelve Step Facilitation (TSF) groups produced the greatest relief from family and social problems. These analyses extend our understanding of the effectiveness of CBT and TSF in treating SUDs in veterans as stand-alone treatment possibilities or as an integral part of an integrated treatment program.

Keywords: veteran, addiction, alcoholism, group therapy, group treatment, meta-analysis, systematic review, substance use disorder, alcohol abuse, drug abuse, abstinence,
This dissertation is dedicated with love to the first Dr. Dice in my life. Thank you so much for believing in me and being so wonderfully patient. I also dedicate this to our kids, Noah, Ruby, Luke and Ronin- thank you as well for your patience and understanding. I hope that in return for their sacrifices, I have modeled the qualities of strength, resilience, devotion and balance toward obtaining one’s goals while at the same time honoring and caring for the family. Thank You!
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I would also like to thank my committee members, Dr. Corrin Richels and Dr. Alan Schwitzer. I appreciate your support during these challenging times completing a dissertation during COVID-19. Dr. Richels spent many countless hours of her own personal time in our never-ending search for Cohen’s $d$. Special thanks as well to my cohort and the shared encouragement that we gave each other throughout this crazy journey. Thank you.
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CHAPTER 1
INTRODUCTION

This chapter introduces the purpose for studying group approaches to treating veterans with substance use disorders (SUDs). The Substance Abuse and Mental Health Services Administration (SAMHSA) determined that 19.7 million people were estimated to have a SUD in 2018 (SAMHSA, 2019). Veteran populations are particularly susceptible to substance use disorders. As reported by the National Institute of Health (NIH) (2019), over one in 10 veterans are diagnosed with a SUD, which is more than what is found in the civilian population.

The problem of SUDs among veterans and the use of varying types of group interventions will be presented. Additionally, a purpose statement establishing the need for identifying effective group treatment approaches for veterans with SUDs is provided, and the significance and implications of this study to the counseling field and counselor education are described. The study’s research questions and design will be identified, as well as the study’s limitations and assumptions. Pertinent definitions will also be provided. The introduction will conclude with an overview of the remaining chapters.

The Problem

In 1986 the U.S. military acknowledged the growing problem of SUD among its servicemembers and implemented restrictive policies in an effort to curtail this growing trend (Teeters, Lancaster, Brown & Back, 2017). Despite these interventions, the rates of SUDs continued to rise in both the active and veteran populations (SAMHSA, 2019). Alcohol is the most common substance abused among veterans (NIH, 2019). For veterans seeking treatment, alcohol has been identified by 64.4% as their primary substance of choice as compared to 37.4% of non-veterans (SAMHSA, 2019). In 2017, specifically related to alcohol, it was reported that prevalence rates among veterans surpassed that of the civilian population pertaining to

Additionally, there has been a 50% increase in cannabis use disorders among veterans between 2002 and 2009 (Teeters, Lancaster, Brown & Back, 2017), and opioid overdoses have risen from 14% in 2010 to 21% in 2016 (Lewei, et. al., 2019). According to SAMHSA, 62,000 veterans were admitted to substance abuse treatment in 2013 (SAMHSA, 2015).

It is not entirely clear whether veterans started abusing substances after they discharged from service, or whether they were effectively “trained” to self-medicate through the use of substances to cope with active duty. It is reported that a high percentage of service members did not drink heavily prior to their time in military service but began drinking more frequently and in greater quantities after joining (NIDA, 2019). In addition, SUDs among veterans can be cooccurring with battlefield issues like posttraumatic stress disorder (PTSD) and/or traumatic brain injuries (TBI), resulting in dual diagnoses becoming more and more prevalent (Capone et al. 2018). When this comorbidity exists for veterans, the treatment usually has poorer outcomes than does treatment for either disorder in isolation (Capone et al, 2018).

Regardless of its origin, SUD among veterans is an issue that points to a growing need to provide effective treatment in VA and non-VA facilities and agencies, as well as for those working with independent clinicians. Many approaches to treatment have been documented for veterans with substance use disorders.

**Treatment Approaches**

Treatment environments for SUDs are available in many forms depending on existing resources and severity of the SUD. SAMHSA’s 1997 description of treatment approaches is still predominant today. They described a range from inpatient residential treatment to address the most severe cases, to intensive outpatient programs to address “moderate” SUDs in a less invasive manner, to weekly check-in programs associated with a monitoring group for relapse
prevention (SAMHSA, 2015; SAMHSA, 1997).

The inpatient residential treatment facility is where the patient is confined to the treatment center 24hrs a day with limited access to the outside world. The intensive outpatient program requires patients to commute from home to their treatment center to participate in three to eight hours of programming three to seven days per week. The monitoring program format meets for one to three hours weekly and typically takes place at a treatment center (SAMHSA, 2015; SAMHSA, 1997). For veterans, these approaches for treatment can be offered through the Veterans Administration associated with veterans’ hospitals or in the private sector (NIH, 2019; U.S. Department of Veterans Affairs, 2019a). A commonality among these various treatment environments is their reliance on group therapy as a primary means of treatment (SAMHSA, 1997; Stinchfield, Owen & Winters, 1994).

**Group Therapy**

The use of group interventions has been found to be effective in the treatment of veterans struggling with SUD (Funderburk, Sugarman, Labbe, Rodrigues, Maisto & Nelson, 2011; Teeters, Lancaster, Brown & Back, 2017; U.S. Department of Veterans Affairs, 2019a). It has also proven to be cost effective by allowing one practitioner to treat many patients at one time (Spitz, 2001). Several types of effective group interventions for treating veterans with SUDs exist.

**Types of Group Treatment for Veterans with SUD**

Substance use disorder therapists use a variety of group treatment models in an effort to best serve their patients. Five of the most popular group therapy models used to treat SUDs among veterans are: skills development groups, interpersonal process groups, psychoeducational groups, cognitive-behavioral groups, and support groups (Weiss, Jaffee, de Menil & Cogley, 2004; Young, Grant, Pulido, Simpson, Tyler & Timko, 2018). Each vary in their goals, role of
therapist, and delivery. They each have strengths that may aid in the treatment of SUDs in veteran populations.

Topic-specific groups (such as anger management and grief) and expressive groups (dance, art therapy, psychodrama, etc.) have also been utilized. However, these are generally incorporated as an “add on” to an existing program and have shown less efficacy as stand-alone treatments for SUDs (SAMSA, 2005; Mims, 2015; Reilly & Shopshire, 2000; Hohmann, Bradt, Stegemann & Koelsch, 2017). Therefore, they were not addressed in the current study.

Skills Development Groups

Skills development groups can be described as a hybrid between cognitive-behavioral and psychoeducational groups (SAMHSA, 2005; Roback, 1979). The primary purpose of these groups is to instill coping skills and strategies that could assist the patient in remaining in recovery (SAMHSA, 2005; Roback, 1979). The inherent nature of group treatment allows group members to practice these newly learned skills within the group prior to implementing them in the real world (Young, et al. 2018; Roback, 1979). While the idea of learning a new coping skill may seem straightforward, the ability to recognize when and where to employ these new skills becomes much more complicated once stress and emotion is considered. The cognitive-behavioral component works to establish new thinking patterns that can then be linked to the newly acquired coping skill (Young, et al. 2018).

While skills development groups are commonly described in the treatment of veterans with SUDs (SAMSA, 2005; Roback, 1979; Weiss, Jaffee, de Menil & Cogley, 2004), a review of the literature has revealed very few studies regarding the efficacy of this group treatment modality.
Interpersonal Process Group Psychotherapy

Interpersonal process group psychotherapy encompasses the many different process-oriented group therapies to address the developmental, environmental and biological influences that can promote and maintain addiction (Lipari & Van Horn, 2017; Spitz, 2001). Through enhancing awareness in the here-and-now process, the therapist promotes change and supports healing (Lipari & Van Horn, 2017; Spitz, 2001). Interpersonal process group therapies often share similar tenets regarding addiction. They are based on the belief that early experiences influence current substance use patterns; that individuals bring their entire lived experiences into the room with them (SAMHSA, 2015). They are also founded on the belief that perceptions often distort reality (Lipari & Van Horn, 2017; Spitz, 2001). These “cognitive distortions” that may have been formed through generalizations made earlier in life can perpetuate counterproductive or harmful substance use or patterns (SAMHSA, 2005). The interpersonal group therapist understands that for many patients, the cognitive and psychological processes that influence behavior often can occur at the sub-conscious level. This understanding can aid in supporting new behaviors that can lead to change (Lipari & Van Horn, 2017; Spitz, 2001).

While interpersonal process groups are described in the treatment of veterans with SUDs (SAMSA, 2005), a review of the literature has revealed very few outcome studies that isolate process-oriented group therapies as they relate to veterans with SUDs. Due to this dearth of data, interpersonal process group psychotherapy were not included in this meta-analysis.

Psychoeducational Groups

Psychoeducational groups offer a balance between addressing cognitive factors, such as information dissemination, and psychological factors, such as expression of feelings (Brown, 2018). The information/teaching component and the psychological/emotional component are included in the purpose and goals for the group. In addition, psychoeducational groups attend to
group process, group dynamics, and the constructive use of therapeutic factors (Brown, 2018). The therapist takes an active role in the group process with a relatively high level of interaction with patients (SAMSA, 2005). Psychoeducational groups have been found to be effective for a variety of conditions and target audiences in the treatment of addiction, including veterans with SUDs (Desai, Harpaz-Rotem, Najavits & Rosenheck, 2009; Funderburk, Sugarman, Labbe, Rodrigues, Maisto & Nelson, 2011; Luciano, McDevitt-Murrphy, Acuff, Bellet, Tripp & Murphy, 2019). Relatively few articles utilizing psychoeducational groups in the treatment of veterans with SUDs were available.

The framework of a psychoeducational group is very similar to many of the instructional modalities used in the military and may seem familiar and comfortable to veterans in treatment (Funderburk, Sugarman, Labbe, Rodrigues, Maisto & Nelson, 2011). However, studies vary in their application of psychoeducational groups for veterans struggling with SUDs. Specifically, there are variations in the number of psychoeducation group sessions and variations in comorbid issues addressed.

**Cognitive-Behavioral Therapy Groups**

Cognitive-Behavioral Therapy (CBT) applied in the group format has also been used successfully in the treatment of SUD for many years and across many populations, including veterans (SAMSA, 2005). As such, articles utilizing CBT groups in the treatment of veterans with SUDs are included in the proposed meta-analysis. CBT’s theoretical framework is based on the premise that behavior change stems from changing the way one thinks (Beck, 2011). In CBT SUD treatment groups, there is a focus on providing a safe environment to explore problematic thought patterns and repetitive addiction-related behaviors that influence the patient’s perception of self (SAMSA, 2005; Beck, 2011; McHugh, Hearon & Otto, 2010). The role of the therapist includes a high level of interaction with patients (SAMSA, 2005; McHugh, Hearon & Otto,
During a CBT SUD session, the therapist helps group members to adjust learned behaviors by considering different perceptions and employing different thinking patterns. The group members also work to cultivate social networks that reinforce their commitment towards abstinence. These strategies are intended to be aligned with positive recovery behaviors that will prevent relapse (McHugh, Hearon & Otto, 2010; Young, et al. 2018).

While studies have been conducted on the efficacy of CBT groups for veterans with SUDs, they vary in their application. As with studies of psychoeducational groups for veterans with SUDs, CBT group studies varied in the number of group sessions and in comorbid issues addressed. CBT group studies also varied in the duration of the treatment.

**Support Groups**

Support groups have also been used successfully in the treatment of SUDs for many years and across many populations, including veterans (SAMSA, 2019). These support groups have been referenced in manuscripts using a variety of names. They are most commonly referred to as Support Groups, 12-Step Recovery group, Twelve Step Facilitation (TSF) groups, or Mutual Community Support group. For the purposes of this meta-analysis, these terms will be used interchangeably. As such, articles assessing the efficacy of support groups in the treatment of veterans with substance use disorders are included in the proposed meta-analysis. Support groups are based in the belief that recovery is a long-term endeavor that requires significant lifestyle changes and ongoing support (SAMHSA, 2005). The type of support provided may vary based on what is needed for day-to-day living in early recovery as opposed to the interpersonally focused support needed for sustained recovery (SAMHSA, 2005). Support groups offer an open and accepting welcome to newcomers and are often attended by those who feel that they are not yet ready to attend “real therapy.” Support groups are often run by a senior member of the group (not a therapist) who focuses on keeping the discussion recovery-related (SAMHSA, 2005).
Support groups are typically less structured than psychoeducational, cognitive-behavioral, interpersonal process, or skills development groups because they are not typically led by a therapist or guided by a group leader’s plan (SAMHSA, 2005).

**Purpose of the Study**

This meta-analysis and systematic review adds to the body of knowledge about the use of psychoeducational, CBT, and support group therapy in the treatment of veterans who have SUDs. Because most studies have included heterogenous groups for veterans addressing issues pertaining to various substances as opposed to homogenous groups of veterans with addictions specific to a particular substance, such as alcohol or marijuana, this study included research addressing veterans with any type of SUD, as defined by the Diagnostic and Statistical Manual-5 (American Psychiatric Association, 2013). This knowledge contributes to evidence-based treatment, provides information about the viability of group therapy for treatment, provides a framework for information dissemination, and has increased our knowledge of the efficacy and efficiency of the different group therapy modalities.

**Significance of the Study**

This study has important implications for counselor education, research and clinical practice. Veterans with SUDs have been shown to have unique challenges and barriers to success (Petrakis, Rosenheck, & Desai, 2011). This study casts light on treatment modalities and interventions to which veterans have responded most positively. This information should also be included in counselor education to better prepare future counselors to meet the needs of veterans. As such, this data significantly improves the knowledge available concerning veteran SUD treatment outcomes.

Currently, only this meta-analyses exists pertaining to group therapy in the treatment of veterans with SUDs. Brady, Credé, Harms, Bachrach and Lester (2019) conducted a meta-
analysis addressing risk factors associated with SUDs of active duty military personnel, and McCarty, Braude, Lyman, Dougherty, Daniels, Ghose and Delphin-Rittmon (2014) conducted a meta-analysis addressing the efficacy of intensive outpatient group therapy for patients with SUD, but they were not affiliated with the military. This study fills a gap in the existing literature. Additionally, this study can aid in directing future research to further contribute to our understanding of the needs of this often-misunderstood population.

Research Questions

This study’s primary purpose was to identify which group therapy treatment approaches and variables produce the best outcomes in veteran populations with SUDs.

Question One

What are viable treatment outcomes for psychoeducational, CBT, and support groups of veterans with SUDs?

Question Two

What are the measures that capture outcomes related to psychoeducational, CBT, and support groups of veterans with SUDs?

Research Design

A preliminary search of seven databases, including Google Scholar, Medline, Psych Articles, Psych Info, Pub Med, Science Citation, and Science Direct was conducted. Key terms were identified from the preliminary database search and then refined using Boolean operators (e.g., AND, OR, NOT, and AND NOT) to extend or narrow the number of manuscripts for consideration. Only studies that include the use of psychoeducational, CBT, or support group/interventions were considered. Studies only included manuscripts published in English after the year 2000. In order to be included in this meta-analysis, the primary sources must included the sample size, mean, and standard deviation for each outcome variable (Borenstein,
Hedges, Higgins, & Rothstein, 2009). Therefore, only quantitative research designs that reported enough data to calculate effect sizes were included. No unpublished works including dissertations and thesis papers were included. No authors are identified in the course of the search, and no emails were sent to solicit data from any unpublished work.

Manuscripts were excluded from the systematic review and meta-analysis if they are published before 2000, were not in English, and/or had insufficient data to calculate an effect size. Therefore, qualitative, conceptual, and descriptive works were not included. Studies that only used participant satisfaction as an outcome variable were excluded as well as any studies where the psychoeducational, CBT, and support group outcomes were incomplete or not included.

Studies on the use of group therapy in SUDs for veterans found that psychoeducational, CBT, and support group therapy modalities are frequently used as a part of treatment or as a stand-alone treatment and that they are most frequently assessed for efficacy. This systematic review and meta-analysis contributes to a better understanding of the role and efficacy of these group therapy approaches in treatment for veterans with SUDS.

A mixed methods research design was used. The qualitative portion applied a systematic review of the literature and the quantitative portion used a meta-analysis. The inclusion, search, and coding procedures to conduct the analysis was implemented using the preferred reporting items for systematic review and meta-analysis protocols (PRISMA – P) (Shamseer et al., 2015). The PRISMA – P is a 17-item checklist designed to create a well-defined guideline for conducting systematic reviews and meta-analyses.

This researcher identified studies that met the inclusion criteria, that were published between 2000 and 2020 and assessed the efficacy of varying types of groups used to treat veterans with SUDs. Google Scholar, Medline, Psych Articles, Psych Info, Pub Med, Science
Citation, and Science Direct were utilized to identify the published studies and satisfy inclusion criteria. Key terms were identified from a preliminary database search and then refined using Boolean operators (e.g., AND, OR, NOT, and AND NOT) to extend or narrow the number of articles and studies for consideration.

Once the articles were determined, data was coded and extracted using a thematic analysis to conduct the qualitative systematic review of the literature. Salient themes were identified from variables in the Methods and Results sections of selected manuscripts.

To conduct the quantitative meta-analysis, the data was exported to other statistical software (Comprehensive Meta-Analysis – 3 software). This software was used to identify either Cohen’s d, or Hedges’ g (Borenstein et al., 2009).

**Limitations**

There was a relatively limited amount of current research on the efficacy of group treatment for veterans with SUDs when SUD is examined in isolation. The current trend appears to be to study the impact of groups on the comorbid issues of SUD and PTSD, TBI, anxiety, or depression, for example. Because of this focus on dual issues, group impact specific to SUD have shown to be less clear in deciphering their results.

Additionally, due to the predominantly male population of the military and larger addiction rates associated with male veterans, the studies included a disproportionately smaller female sample or no females at all. This limitation has impacted our ability to identify differences in efficacy based on gender. Another noted limitation was that some studies relied almost entirely on patient self-reports. In the field of SUDs this may raise questions regarding their reliability and validity as mentioned in Richer & Johnson’s 2001 study. Lastly, due to variations in the studies of group treatment for veterans with SUD, there was not sufficient homogeneity to combine all effect sizes credibly. Moreover, disaggregating studies by group
type and additional variables resulted in too few studies available for inclusion in subgroup analyses.

**Definitions**

The following terms were relevant to the studies found pertaining to the efficacy of group treatment used for veterans with substance use issues:

1. **Veteran**: is someone that has previously served in one of the armed forces (Army, Navy, Air Force, Coast Guard & Marines). Veterans are a population that is often exposed to traumatic events/stressors and may experience posttraumatic stress disorder (PTSD), depression, anxiety and alcohol or substance use disorders (Petrakis, Rosenheck, & Desai, 2011)

2. **Substance Use Disorder (SUD)**: is a condition were the use of one or more than one substance (including alcohol) leads to a significant impairment or life stressor (Guha, 2014). Substance use disorders often manifest as physical, mental, and behavioral symptoms that could potentially strain one’s family, work or social life. SUD often progresses to a point where use becomes hazardous, tolerance builds, and withdraw becomes sever. According to the DSM-5, substance abuse and substance dependence have been combined into one category called substance use disorders. Substance use disorder severity is classified as either *mild, moderate, or severe* depending on how many of the 11 diagnostic criteria are met (Guha, 2014). Other variations of this term (alcohol use disorder, cannabis use disorder, etc.) may be used to delineate a specific substance. For the purposes of this study, Alcohol Use Disorder will be used to refer to issues surrounding alcohol and Substance Use Disorder will be used to include all substances including alcohol.
3. **Alcohol Abuse and Alcohol Dependence**: These terms were used by the DSM-IV and there has been a noted shift from their use since the release of the DSM-5 towards Alcohol Use Disorder or the all-encompassing Substance Use Disorder. The need for updated terminology stemmed from the confusion between the use of the terms. The term “dependence” was problematic in that someone could be dependent on a prescription medication but not addicted to it. The DSM-5’s use of “Substance Use Disorder” better captures the social and health problems associated with addiction while the DSM-IV’s terminology focuses more on just the health issues (SAMHSA, 2017).

4. **Co-occurring**: According to the National Institute of Drug Abuse (NIDA), co-occurring refers to two (or more) diagnosis that are linked in some way like substance use disorder and mental health issues this is also referred to as a dual-diagnosis, If the two diagnosis are separate then they are said to be “comorbid.”

5. **Comorbid**: According to (NIDA), comorbid refers to an individual having two (or more) separate diagnosis or illnesses, either at the same time or one-after-another. If the two diagnosis are linked in some way like mental health and substance use disorders, then they are referred to as being a “dual-diagnosis” or a “co-occurring” disorder.

6. **Cognitive Behavioral Group Therapy (CBGT)**: refers to a group approach that makes use of relational, behavioral, cognitive, and group procedures to enhance the coping skills of the group members and restructure relational and intrapersonal problems that the group members may be experiencing (Weiss, Jaffee, Menil, & Cogley, 2004).

7. **Psychoeducational Group Therapy**: are defined as groups that have a balance between cognitive factors such as information dissemination and psychological factors such as expression of feelings. There tends to be a strong information/teaching component that is balanced with the psychological/emotional component that is associated with the purpose
and goal for the group. In addition, psychoeducational groups attend to group process, group dynamics, the constructive use of therapeutic factors, and have been found to be effective for a variety of conditions and target audiences (Brown, 2018).

8. **Support Groups:** are a group of people with common experiences or concerns that meet regularly to provide each other with encouragement, comfort, and support. These groups are typically nonprofessional and comprised of members who share the same problem or issues and voluntarily meet to support one another in the recovery from their problems or issues. Examples of MSGs are 12-Step groups, PTSD support groups, and grief groups (Donovan, Ingalsbe, Benbow, & Daley, 2013).

9. **Meta-analysis:** is a statistical analysis that combines data from multiple scientific studies. This can be done when there are multiple studies addressing the same topic, with each individual study supplying data that is expected to have some degree of error. Then through using statistics, a pooled estimate closest to the unknown common truth is derived based on how this error is perceived (Rothman, Greenland, & Lash, 2019).

**Conclusion and Overview**

This chapter outlined the meta-analysis and systematic review that makes up this study. This chapter started with an introduction, statement of problem, and an overview of pertinent literature related to group therapy interventions in the treatment of veterans with SUDs. The chapter then followed with a general overview of addiction and then focused on addiction as it relates to the veteran population. Next, the chapter looked at the varying treatment approaches used with veterans with SUD and particular focus was given to group interventions due to their prevalence in treatment approaches. The chapter then moved into the significance of the study after which the research questions were outlined. The chapter then concluded with a description of the research design, an outline of noted limitations, and definitions of terminology pertinent to
this study. The following chapter will pursue a more robust literature review and cover the methodology used. The coming chapter will conclude with a discussion of results and implications of the findings uncovered by this study.
Chapter 2

Review of the Literature

This chapter provides an overview of pertinent literature related to group therapy interventions in the treatment of veterans with substance use disorders (SUDs). The chapter begins with a general overview of addiction and then focuses on addiction as it relates to the veteran population. Next, approaches to treating veterans with SUDs will be addressed with a particular focus on group interventions due to their prevalence in treatment approaches. This chapter concludes with an examination of the need for further research on this topic.

Substance Use Disorder Defined

A SUD is defined by the Diagnostic and Statistical Manual of Mental Disorders version 5 (DSM–5) as meeting two or more of the following criteria in a twelve-month period: hazardous use, social/interpersonal problems related to use, neglecting major roles to use, having use-related legal problems, having use withdrawal, having tolerance to use, using larger amounts for longer, repeated attempts to quit or control use, increased time spent using, physical/psychological problems related to use, activities given up to use (DSM-5, 2013). Other terms commonly used to describe SUDs in studies include: substance dependence, alcohol dependence, substance abuse and alcohol abuse. These terms refer to the terminology used in the Diagnostic and Statistical Manual of Mental Disorders version 4 (DSM–4) where dependence and abuse were used to denote different levels of severity, with dependence being the more serious of the two. These terms were combined in the DSM-5 in 2013 to form the diagnosis of “substance use disorder” with denotations of mild, moderate and severe to indicate severity (Hasin, O'Brien, Auriacombe, Borges, Bucholz, Budney & Grant, 2013).
Substance Use in Society

Addiction to legal and illegal substances is a serious issue in the United States. The Substance Abuse and Mental Health Services Administration (SAMHSA) reported that over 19.7 million people ages 12 and older were estimated to have a diagnosable SUD in 2017 (SAMHSA, 2017). According to the National Institute on Drug Abuse, marijuana is most commonly abused with an estimated 4.2 million Americans meeting criteria for marijuana use disorder (NIDA, 2015). Opioid addiction has most recently been deemed an epidemic in the United States, with overdose deaths having quadrupled since 1999 (Department of Health and Human Services, 2016). This widespread phenomenon has severely taxed the U.S. economy with an estimated $740 billion-dollars lost in healthcare expenses, workplace productivity, and crime-related costs (NIDA, 2017).

Among those with substance use disorders, only 18.5% receive treatment (NIDA, 2015), and approximately 34-45% of those drop out of treatment before three months (McHugh, 2013; Palmer, Murphy, Piselli, & Ball, 2009; Staiger et al., 2014). Furthermore, between 40-60% of individuals have been found to relapse following treatment (NIDA, 2012). Substance use disorders are a major area of concern in society and in the helping professions (U.S. Department of Health and Human Services, 2018). This concern extends to veterans with substance use disorders.

Veterans and Substance Use

Veteran populations have shown to be particularly susceptible to SUDs. As reported by the National Institute of Health (NIH), over 1 in 10 veterans are diagnosed with a SUD, which is more than what is found in the civilian population which has been reported to have 1 in 12 diagnosed (NIH, 2019; SAMHSA, 2017). The most common substance abused among veterans is alcohol (NIH, 2019). Alcohol has been identified by 64.4% of veterans seeking treatment as
their primary substance of choice as compared to 37.4% of non-veterans (SAMHSA, 2015). In 2017, veterans surpassed the civilian population pertaining to diagnosable SUD particularly related to alcohol abuse (Teeters, Lancaster, Brown & Back, 2017). Additionally, between 2002 and 2009 there has been a 50% increase in cannabis use disorders among veterans (Teeters, Lancaster, Brown & Back, 2017), and opioid overdoses have risen from 14% in 2010 to 21% in 2016 (Lewei, et. al., 2019).

A search of the literature failed to show whether veterans started abusing substances (alcohol included) after they discharged from service, or whether they were effectively “trained” to self-medicate through the use of substances to cope with active duty. Military service can be very stressful; being away from friends and family, intensive training regimens and exposure to the stressors of war have all been managed over the years through the time-honored tradition of drinking with fellow servicemembers (Teeters, Lancaster, Brown & Back 2017). It is reported that a high percentage of service members did not drink heavily prior to their time in military service but began drinking more frequently and in greater quantities after joining the military (NIDA, 2019).

In addition, SUDs among veterans can be co-occurring with post-traumatic stress disorder (PTSD) and/or traumatic brain injury (TBI) and in recent years, a dual diagnosis has become more prevalent (Capone et al. 2018). Post-traumatic stress disorder (PTSD) is a mental health condition that can be brought on by exposure to a traumatic event, while a traumatic brain injury (TBI) is commonly caused from a violent impact or jolt to the head (Teeters, Lancaster, Brown & Back 2017). Both of these conditions have a wide array of overlapping symptoms that are frequently self-medicated through the use of drugs or alcohol (Teeters, Lancaster, Brown & Back 2017; Petrakis, Rosenheck, & Desai, 2011).
Consequences of SUD for Veterans

The consequences that often accompany SUD tend to be exacerbated by this population’s veteran status. Like the general population, they may experience elevated rates of unintentional injuries, domestic violence, automobile accidents, and hospitalizations, but unlike the general population, veterans are often considered to be immune to SUDs (Teeters, Lancaster, Brown & Back, 2017). It is commonly assumed that this population is able to handle more (stressors, alcohol, hardships, etc.) than the general population (Teeters, Lancaster, Brown & Back, 2017; Funderburk, Sugarman, Labbe, Rodrigues, Maisto & Nelson, 2011). An example of this is when exorbitant amounts of money are spent on drugs or alcohol, yet this poor financial decision is unchallenged because it is assumed that the servicemember can handle it. Another example would be when veterans drink daily and/or drink copious amounts of alcohol at a time, living up to the stereotype of “drinks like a sailor.” This behavior could go on for years unchallenged while a civilian counterpart may garner concern and be provided opportunities for treatment much sooner (Teeters, Lancaster, Brown & Back, 2017).

The military culture allows for a lot of latitude as long as the servicemember is able to fulfill their duties. New servicemembers learn from senior members how and when to drink and still be able to meet the needs of the military (Mattiko, Olmsted, Brown, & Bray, 2011). The military, by default, becomes the limiter to how much a servicemember drinks. Whether it is having to stop drinking 8 hours before the servicemember reports to their duty station or having to “dry-out” and refrain from drinking for a 3-6 month deployment, the military works to keep the servicemember’s drinking in check (Mattiko, Olmsted, Brown, & Bray, 2011). Unfortunately, all too often when a veteran exits the military they struggle with the lack of structure in the civilian world and their drinking proceeds unchecked (Teeters, Lancaster, Brown & Back, 2017).
In addition to society assuming that veterans can handle their substance use, veterans themselves are known to put tremendous pressure on themselves to be able to handle stressors. This internalized pressure to be self-supporting and not need any outside help is seen as “strong” to the veteran and conversely, asking for any kind of help is construed as a sign of “weakness” (Teeters, Lancaster, Brown & Back, 2017). This autonomous existence can be attributed to a deeply instilled mindset that is cultivated in bootcamp and perpetuated throughout their military career. It insists that the servicemember be “inspection ready” at all times; essentially presenting as perfect as an indicator of success, identity and self-worth (Teeters, Lancaster, Brown & Back, 2017). This process of learning not to disclose problems and to manage adversity on their own can be carried into the civilian world upon discharge from the military and can work to impede the veteran’s ability to seek help for SUD. Consequently, it may manifest through increased rates of homelessness, poor self-care, relational issues, and declining mental health (Moore & Skinner, 2017; Tsai & Rosenheck, 2015; Teeters, Lancaster, Brown & Back, 2017).

As mentioned earlier, service-related issues like post-traumatic stress disorder (PTSD) and traumatic brain injuries (TBI) are often self-medicated through the use of alcohol and/or pain medication. This self-medicating can last for years and can develop into a SUD that further isolates the veteran and can make proper diagnosis of the underlying conditions difficult (Petrakis, Rosenheck & Desai, 2011; Tsai & Rosenheck, 2015). When SUDs co-occur with PTSD and/or TBI, the treatment usually has poorer outcomes than does treatment for either disorder in isolation (Hildebrand, Behrendt, & Hoyer, 2015; Capone et al, 2018). Considering veterans face the typical consequences experienced by the general population as well additional consequences related to their status as a veteran, it is important for SUD treatment to be tailored to this population (Capone et al, 2018).
**Treatment for Veterans with SUD**

The United States Navy in 1986 noted a growing trend of SUD diagnoses among its sailors. In an effort to resolve this issue the Navy implemented new policies including an increase in its Random Urinalysis Program (RUP) (Larson, Wooten, Adams, & Merrick, 2012; Teeters, Lancaster, Brown & Back, 2017). In 2002, a Marine base in southern California changed its policy to prohibit Marines under the age of 21 from crossing into Mexico. This policy change resulted in the reduction of underaged drinking incidents by 78%. In 2010, out of all the services, the Air Force reported the lowest rates of heavy drinking, with servicemen reporting 24.5% and servicewomen reporting 6.3%. These were still higher than the civilian rates of 9% for men and 4.1% for females, in response the Air Force adopted the “Make the Connection” program that works to reduce the stigma that getting treatment will harm one’s carrier (Holleran, Steiker, McCarthy & Downing, 2012; NIDA, 2017). Despite these added safeguards across the various branches of the military, the SUD diagnoses among servicemembers continued to increase in both the active duty and veteran populations. According to SAMHSA, 62,000 veterans were admitted to SUD treatment in 2013 (Larson, Wooten, Adams, & Merrick, 2012; SAMHSA, 2015).

This points to an increasing need for effective treatment for both active duty and veteran populations in the civilian sector as well as in the Veterans Administration (VA) system. Numerous treatment approaches have been studied in an effort to better serve these servicemembers. These treatment approaches include group interventions that are part of either inpatient residential treatment, intensive outpatient treatment or weekly monitoring groups (SAMHSA, 2015).
Treatment Approaches

As discussed in chapter one, treatment approaches to addiction are often delivered in the following forms: inpatient residential treatment, intensive outpatient programs, and weekly check-in programs (Funderburk, et al. 2011; Galanter, Kleber, & Brady, 2014). All of these provide various levels of accountability through both attendance and randomized drug and alcohol screens. The amount of treatment or level of care that a patient receives varies widely and depends on the severity of the SUD diagnosis and the requirements of any governing agency (if any) to which the patient must report.

Inpatient Residential Treatment

The most severe cases are generally placed in an inpatient residential treatment center where patients are isolated from their existing lives and confined to the actual physical location of the treatment facility. The highest level of care in residential treatment would be a medically assisted detox and stabilization (Galanter, Kleber, & Brady, 2014). This level of care is reserved for patients that are currently detoxing from their addicted substance and provides the most restrictions to patients to ensure their safety. They are often monitored 24 hours a day and are not allowed to leave the facility.

The next lower level of care from detox and stabilization is standard inpatient care. This level of care confines patients to the treatment facility with limited contact with the outside world. Support is given as they work through early withdrawal symptoms, as well as when they transition to addressing the socioemotional consequences of their SUD. This level of care is typically reserved for patients that are unable to stop drinking or using drugs without life-altering interventions (Galanter, Kleber, & Brady, 2014).

Inpatient treatment facilities vary widely in their approaches to recovery. However, the majority of inpatient treatment facilities do share the following components: group work,
individual work, and psychoeducation (Funderburk, et al. 2011; Galanter, Kleber, & Brady, 2014). These facilities often use an open enrollment format that allows for ongoing intakes and discharges. The length of time spent in these treatment centers also varies widely, from a 7-day detox to a 365-day immersive experience (Funderburk, et al. 2011; Galanter, Kleber, & Brady, 2014). A common standard used to treat a patient’s first encounter with an inpatient facility for a SUD is 28 days. This length of stay can be extended based on recidivism. Professional licensure boards (legal, medical, aviation, etc.) often require a minimum 12-week inpatient stay followed by 5 years of monitoring in order preserve a patient’s professional license (Funderburk, et al. 2011; Galanter, Kleber, & Brady, 2014).

The group work conducted in these centers is composed of a combination of interpersonal process and psychoeducational group therapies. Individual sessions are also typically linked to a treatment team that works to stabilize, set goals, and assess progress. The process of assessing stabilization is crucial in that it allows patients to shift to lower levels of care such as intensive outpatient programs (Galanter, Kleber, & Brady, 2014).

**Intensive Outpatient Programs**

At the intensive outpatient program (IOP) level of care, patients that are diagnosed with a mild to moderate SUD are permitted to live in their own residence (provided that their residence is a safe environment that is conducive to recovery) and attend 3 to 8-hour group programming sessions that meet 3 to 7 days per week (Galanter, Kleber, & Brady, 2014). The IOP sessions predominately utilize a combination of the following group approaches: skills development, interpersonal process, psychoeducation, and cognitive-behavioral therapy (Galanter, Kleber, & Brady, 2014; McHugh, Hearon, & Otto, 2010). IOPs typically apply an open group format that allows for ongoing intakes and discharges. Lengths of treatment vary between 4 to 12 weeks.
with the literature indicating that 6-8 weeks are applied most frequently (Funderburk, et al. 2011; Galanter, Kleber, & Brady, 2014).

The IOP can be used as a stand-alone treatment for mild to moderate SUD or it can serve as a step-down from inpatient treatment (Galanter, Kleber, & Brady, 2014). Either course of treatment (stand-alone or step-down), serves as both structure and accountability with random drug and alcohol screens as well as daily check-ins (Galanter, Kleber, & Brady, 2014). The patient that is new to recovery can benefit from this format as it allows for the real-time processing of the patient’s work life, family life and recovery life.

**Weekly Check-In/Monitoring Programs**

The treatment format with the least amount of oversight and structure is check-in and monitoring programs. These are often used to assist in stepping-down from either inpatient or IOP treatment (Galanter, Kleber, & Brady, 2014). This service is sometimes referred to as “aftercare” and consists of 1 to 3-hour sessions that meet 1 to 4 times a month (Galanter, Kleber, & Brady, 2014). Many licensure boards require years of monitoring to protect against relapse. As such, this service can last between 6 months to 5 years depending on agency requirements. It also incorporates random drug and alcohol screens (Galanter, Kleber, & Brady, 2014).

For veterans, these approaches for treatment can be offered through the Veterans Administration associated with veterans’ hospitals or in the private sector (NIH, 2019; U.S. Department of Veterans Affairs, 2019a). A commonality among these various treatment environments is their reliance on group therapy as a primary means of treatment (SAMHSA, 2019; SAMHSA, 1997; Stinchfield, Owen & Winters, 1994).
Types of Group Therapy for Veterans with SUD

Skills Development Groups

Skills development groups used for SUD commonly apply a cognitive behavioral orientation and use psychoeducational components to help patients develop coping skills that can be used in place of substances (Galanter, Kleber, & Brady, 2014; McHugh, Hearon, & Otto, 2010). This group approach may appear very similar to a psychoeducational group, but its focus is on developing and practicing specific skills while a psychoeducational group focuses on expanding a patient’s knowledge base so that they can make better informed decisions.

The most common type of skills development groups for SUD involve learning and implementing coping skills to sustain a patient’s abstinence (McHugh, Hearon, & Otto, 2010). These skills may include techniques to deal with cravings, avoiding triggering situations, and ways to refuse drugs or alcohol if offered. It is assumed that patients either do not have these needed skills or have lost them as a consequence of their SUD. The interpersonal nature of these skills’ development groups allows for practice and roleplaying to further develop these needed skills.

Topor, Grosso, Burt & Falcon (2013) described the use of a skills development group for the treatment of veterans with SUD who also suffer from severe mental illness. The Skills For Recovery (SFR) open-ended group consisted of 8-12 members seeking services from the VA Healthcare system in Boston. They described using the Group Treatment for Substance Abuse: A Stages-of-Change Therapy Manual and application of the International Association for Social Work with Groups (IASWG) Standards for Social Work Practice with Groups to address the mental health needs and SUDs among participants. They described methods for assessing participants’ progress toward recovery goals, however no data was presented in the article.
Similarly, Schonfeld, Dupree, Dickson-Fuhrmann, Royer, McDermott, Rosansky, & Jarvik (2000) described the GET SMART program, in which older veterans with substance use issues applied CBT techniques to develop and practice skills within their group to remain abstinent. Skills development groups such as these are commonly described in the treatment of veterans with SUDs (SAMSA, 2005; Roback, 1979; Weiss, Jaffee, de Menil & Cogley, 2004), but a review of the literature has revealed very few empirical studies regarding the efficacy of this group treatment modality. Due to this lack of data, skills development groups were not included in this meta-analysis.

**Interpersonal Process Groups**

Substance use disorder treatment using the interpersonal process group (IPG) model can trace its roots to a vast body of existing theory (Flores, 1988; Flores & Mahon, 1993; Khantzian et al., 1990, Matano & Yalom, 1991; Vannicelli, 1992, Washton, 1992). IPGP uses psychodynamics as a way to illicit change in patients (SAMHSA, 2005). The IPG approach underscores the conflicting forces at work in the patient’s mind and in their behavior and can bring to the surface these forces when they exist outside the patient’s awareness. The process of enhancing the patient’s awareness of how others in the group are reacting psychologically to the patient is leveraged to promote self-awareness.

Within the IPG framework, developmental and environmental factors from childhood through adulthood are assumed to have an impact on current experience. The environmental elements are influenced by biological and genetic traits, both of which are seen to influence addiction (SAMHSA, 2005). The primary focus of these sessions takes place in the here-and-now and the interpersonal relationships between group members is paramount. Little attention is given to feelings generated in the past or outside the group session. The group members become
able to better identify problematic relationship patterns, and with the help of the group, members
are able to begin changing destructive patterns (SAMHSA, 2005).

IPG has been described as a treatment component used by Wray, Welch, Civetti, Hoyt,
Anthony, Ballester, & Tandon (2019) to address veterans with SUD. Their study assessed a
veteran’s program called VETSTEPS (Veterans Engaged in Treatment, Skills, and Transitions
for Enhancing Psychiatric Safety). In this study, 219 military veterans’ retrospective data was
used to assess the efficacy of the program’s three strategies for assisting veterans to reintegrate
into society and reduce SUD rates associated with this transition. The three strategies consisted
of using inpatient/outpatient care collaboration, contacting veterans four times via phone calls in
their first week, and participating in a four-week evidence-based intervention that included
interpersonal process groups, coping skills training, and post-discharge services orientation. The
study demonstrated, among other things, that greater group participation was correlated with
lower 12-month readmission to the VETSTEPS program and lower rates of SUD. However, this
study did not contain data that isolated the efficacy of the interpersonal process group
components.

While IPGs are described in the treatment of veterans with SUD, in studies such as the
one just described, a review of the literature has revealed very few outcome studies that isolate
process-oriented group therapies as they relate to veterans with SUDs. Due to this dearth of data,
interpersonal process group psychotherapy was not included in this meta-analysis.

**Psychoeducational Groups**

The primary purpose of psychoeducational groups is to better educate patients about their
substance use issues, potential consequences, and approaches to addressing the problem, while
also helping them to address psychological factors that help them to gain greater self-awareness
(Brown, 2018; Teeters, Lancaster, Brown, & Back, 2017; Weiss, Jaffee, Menil de, & Cogley,
The educational material covered in these groups is often presented via video, literature, lecture, activities and group process. The psychological components are addressed through attention to the group dynamics and the use of therapeutic factors (Brown, 2018). The purpose of these groups is to instill awareness and offer options that may illicit personal growth. The group’s focus is to educate and develop understanding from which better decisions hopefully will be made. A secondary purpose of these groups is to meet patients at their current developmental levels and offer information and opportunities for group feedback that may gently challenge them to move into a recovery ready state (Brown, 2018).

These groups can help address the client’s denial around their SUDs, help them identify maladaptive patterns associated with their SUD, and enhance their awareness of the benefits of continued abstinence. The educational components of psychoeducational groups can include the learning of new skills (Lancaster, Brown, & Back, 2017). Patients are made aware of new skills to employ and when they would be most effective. Psychoeducational groups are one of the most frequently used groups in the inpatient treatment setting, and a noted few treatment studies pertaining to veterans were actually found (Lancaster, Brown, & Back, 2017). As such, articles utilizing psychoeducational groups in the treatment of veterans with substance use disorders were included in this meta-analysis.

**Psychoeducational groups for veterans:**

Studies of psychoeducational groups for veterans with SUDs ranged from reporting results of single session groups (Luciano, McDevitt-Murphy, Acuff, Bellet, Tripp & Murphy, 2019) to interventions that included 25 sessions (Desai, Harpaz-Rotem, Najavits & Rosenheck, 2009). Moreover, no studies addressed SUD alone. Rather, an additional component (comorbidity) was addressed such as: depression, anxiety, post-traumatic stress disorder (PTSD), or nicotine addiction. For example, Luciano et al. (2019) employed a single session
psychoeducational group to treat veterans that abused alcohol and also exhibited symptoms of PTSD. This study included 68 combat veterans (8.8% female; 27.9% African American) and targeted coping strategies for alcohol misuse and PTSD symptoms. An additional motivational interview (MI) style session was also randomly assigned to half of the participants. In both conditions, at the 6-week and 6-month mark, participants reported significantly lower numbers of PTSD episodes and symptom severity, as well as a decrease in alcohol use. The condition with just the psychoeducational group and the condition with both the psychoeducational group and the MI session did not show any significant difference in treatment outcomes.

Using a multi-group model, Desai et al. (2009) employed a 25-session psychoeducational group intervention over a period of 6 months with additional follow-ups every 3 months for the following year to address 450 homeless female veterans with comorbid SUDs and trauma histories. The psychoeducational groups focused on coping skills and were offered in 2 phases. The first phase (n=359) was offered to participants without an add-on “Safety Seeking” psychoeducation training given to the administering clinicians. The second phase (n=91) was offered to participants after the administering clinicians received the “Safety Seeking” training. The implementation of 25 psychoeducational groups resulted in positive outcomes for both groups as evidenced by significant improvements in clinical outcomes over the course of the year, with the “Safety Seeking” phase showing enhanced improvements in social supports, PTSD symptoms, employment, and substance use (Desai et al., 2009).

**Psychoeducational groups as control groups:**

A review of the literature also revealed that psychoeducational groups are commonly implemented as the control when conducting studies of veterans with SUD (Bonar, Walton, Cunningham, Chermack, Ilgen, Blow & Booth, 2017; Mulligan, Fear, Jones, Alvarez, Hull, Naumann & Greenberg, 2012). In these instances, psychoeducational groups were being used to
treat veterans with SUDs but were not the focus of the studies. In both Walker, Walton, Neighbors, Kaysen, Mbilinyi, Darnell, Rodriguez & Roffman’s (2016) study and in Ilgen, Bohnert, Chermack, Conran, Jannausch, Trafton and Blow’s (2016) study, psychoeducational groups were used as the control group. In Walker et al’s study, they aimed to assess the efficacy of using motivational interviewing plus feedback to treat veterans with SUDs. The treatment group consisted of 121 veterans who received motivational interviewing sessions, while 121 veterans were placed in the control group that consisted of psychoeducational groups focused on relapse prevention. Results indicated both groups significantly reduced participants’ drinking over time with a marginally lower alcohol dependence diagnosis associated with the motivational interviewing group according to a 6-month follow-up. In Ilgen et al’s (2016) study, they used a psychoeducational control group of 66 individuals to contrast their results from a psychosocial pain management intervention for 65 veterans that suffered from both chronic pain and substance use disorder. After 10 weekly sessions, group members were then assessed at the 3, 6, and 12-month marks. The pain management intervention group predicted significantly lower pain intensity than the psychoeducational control group \( \beta \text{ [standard error (SE)] = } -0.71 (0.29); 95\% \text{ confidence interval (CI) = } -1.29, -0.12 \). Additionally, the pain intervention group reported a lower frequency of alcohol consumption compared to the psychoeducational control \( \beta \text{ (SE) = } -0.77; 95\% \text{ CI = } -1.34, -0.20 \) (Ilgen et al’s, 2016). Results indicated that the pain management intervention was significantly more effective than the psychoeducational group for both pain management and reduction of alcohol use. However, there were no significant differences in drug use between the two types of groups.

The review of the literature revealed three outcome studies addressing the efficacy of psychoeducational groups in the treatment of SUD among veterans. Some included many sessions while others included few, and some assessed psychoeducational groups directly while
others used it as the control. Because the studies were conducted after 2000, were quantitative in nature, and included appropriate sample sizes they were considered for this meta-analysis.

**Cognitive-Behavioral Therapy Groups**

Cognitive-behavioral therapy (CBT) groups are widely used in the treatment of SUD and have several components that work well, particularly in early recovery (McHugh, Hearon, & Otto, 2010). The process of systematic change through cognitive restructuring serves as the underlying premise to CBT groups (Beck, 2011). These groups address addiction as a learned behavior that can therefore be unlearned. This is accomplished through behavior modification that is accomplished through specific interventions that target conditioned stimuli related to the addict’s behavior. The process of change is supported by other group members and the development of a strong recovery network who reinforce changing perceptions, beliefs and thinking patterns (Beck, 2011).

Cognitive-Behavioral Therapy (CBT) applied in the group format has been used successfully in the treatment of SUD for many years and across many populations, including veterans (U.S. Department of Veterans Affairs, 2019a; SAMSA, 2005). As such, articles utilizing CBT groups in the treatment of veterans with substance use disorders were included in this meta-analysis.

**Cognitive-Behavioral Therapy groups for veterans:**

Studies of CBT groups for veterans with SUDs varied considerably in the number of sessions provided and the duration of treatment. The number of CBT group sessions ranged from 5-36 sessions (Bonar, Walton, Cunningham, Chermack, Ilgen, Blow & Booth, 2017; Brown, Glasner-Edwards, Tate, McQuaid, Chalekian & Granholm, 2006), and the duration of the studies varied from 12 to 25 weeks in length (Haller, Norman, Cummins, Trim, Xu, Cui & Tate, 2016; Worley, Trim, Roesch, Mrnak-Meyer, Tate & Brown, 2012). They also addressed comorbid

Regarding variations in the number of sessions provided, in 2017, Bonar et al. conducted a 5-session CBT group for veterans (N = 119) with SUDs that also suffered from partner violence perpetration (VP) (70% men and 30% women). These participants were then randomized into an Integrated Violence Prevention Treatment (IVPT) that consisted of 5 CBT sessions focused on VP prevention skills or a control group that consisted of 5 psycho-education sessions focused on the treatment of SUD. Results showed that VP and illicit drug use decreased considerably at the 3-month follow-up for both groups, and the CBT group showed a significant decrease in alcohol use. The findings suggested that CBT focused on VP prevention skills could be seen as a feasible intervention for SUD.

Utilizing far more sessions, Brown et al. (2006) conducted a 36-session randomized group treatment study that examined the longitudinal outcome patterns of veterans (N = 66) with SUD and major depressive disorder (MDD). The study compared a 12-Step Facilitation (TSF) group to a disorder-specific CBT group. Both groups reported improvements throughout treatment for SUD and MDD, however results indicated that the CBT groups showed a continued reduction in substance abuse at the 6-month posttreatment mark.

There were also variations noted in length of treatment. Haller et al. had veterans (N = 123, 89% male) with SUD, PTSD and depression issues participate in bi-weekly CBT groups over a period of 12 weeks. During that time participants were randomly assigned to either a CBT group or a cognitive processing therapy group that was modified to treat SUD (CPT-M). Results indicated that members of both groups displayed slight improvements with depression and PTSD symptoms, with significant improvements in substance use. These improvements were
maintained through the one-year mark with a slight advantage in heavy drinking outcomes associated with the CPT-M groups.

More than doubling the treatment time, Worley, Trim, Roesch, Mrnak-Meyer, Tate & Brown (2012) conducted a 25-week CBT group for veterans with SUDs (N = 237, 90% male, 70% Caucasian) and assessed the longitudinal association between SUD and major depression symptoms. They compared groups receiving either CBT or twelve-step facilitation at 3 months, 6 months, 9 months and 1 year. Results indicated that an increase in substance use predicted varying elevations in depression exceeding levels at the start of the study. Additionally, as depressive symptoms changed there was an association made with 1) the probability of substance use, and 2) an increase in the frequency of use. Results suggested a correlation between the substance use and depressive symptoms.

The literature revealed very few studies in which CBT group treatment for veterans was used solely for SUDs, but rather, the majority of the studies addressed the comorbidity of SUDs and other issues (Brown et al, 2006; Granholm et al, 2011; Shamseer et al, 2015; Acosta et al, 2017). In addition to the studies already described, this is demonstrated by McGuire, Mota, Sippel, Connolly & Lyons (2018). They used CBT group treatment augmented with cognitive processing therapy (CPT) in an effort to enhance outcomes in veterans with SUD and PTSD. Their study included 29 male veterans who participated in a 6-week residential day treatment including cognitive processing therapy (CPT) for PTSD and group CBT for substance use disorder. Participants showed increased resilience (Mdiff = 14.24, t = −4.22, p <.001, d = 0.74) as well as decreases in substance use disorder and trauma-cued cravings (β = −0.39, p =.006, sr = −.38) and PTSD symptoms (β = −0.37, p =.049, sr = −.36) after treatment. The study suggested that CBT augmented with CPT for comorbid PTSD and substance use disorder may assist
strength-based psychological growth, which may further promote a reduction of symptoms and cravings.

The review of the literature revealed seven outcome studies addressing the efficacy of CBT groups in the treatment of SUD among veterans. Studies varied by the number of sessions and duration of treatment. Several also examined the comorbidity of SUDs and other issues. Because the studies were conducted after 2000, were quantitative in nature, included appropriate sample sizes, and reported outcomes in a complete manner, CBT groups for veterans with SUD will be included in this meta-analysis.

Support Groups

In the treatment of substance use disorders, support groups have been documented to provide long term, low to no-cost support to those committed to addressing addiction (Bonn-Miller, Zvolensky, & Moos, 2011; Gossop, Stewart, & Marsden, 2008; Donovan, Ingalsbe, Benbow, & Daley, 2013; Lipari, & Van Horn, 2017). These groups are generally based on the belief that recovery can be maintained when like-minded individuals meet and provide mutual support and guidance. Since recovery from a SUD typically requires significant and ongoing lifestyle changes beyond that of traditional inpatient and outpatient programs, support groups can offer maintenance programming (Gossop, Stewart, & Marsden, 2008; Lipari, & Van Horn, 2017; SAMHSA, 2015; SAMHSA, 1997). Though there are many different types of support groups available, including those that address specific substances or behaviors, the underlying tenants remain very similar – a desire to change, unconditional acceptance, honesty, and inward reflection. Most support groups’ primary focus is encouraging and maintaining abstinence with less emphasis on exploring the root of addiction (Lipari, & Van Horn, 2017). Support groups are often peer-led and the focus can oscillate between addressing the day-to-day challenges of sober
living for those in early recovery to addressing interpersonal and self-development issues for those in later stages of recovery.

Support groups assist those in recovery as they learn to manage their emotions. While group members offer challenge to dysfunctional thinking patterns, they do so by sharing their lived experiences as opposed to giving advice (Lipari, & Van Horn, 2017). Additionally, support groups can normalize erratic thought patterns and strong emotional swings that are often present during early recovery. This normalization works to improve self-esteem and promotes self-confidence. Support groups are not process groups in that they tend to be narrower in focus, more direct and overall, less complex. This lack of structure (when compared to process groups) may be more appealing to those anxious about committing to a substance use program and may serve as an introduction to a lifestyle of recovery (Lipari, & Van Horn, 2017).

Support groups have been used successfully in the treatment of SUDs for many years and across many populations, including veterans (SAMSA, 2015; SAMSA, 2005; U.S. Department of Veterans Affairs, 2019b). As such, articles assessing the efficacy of support groups in the treatment of veterans with substance use disorders are included in this meta-analysis.

**Support groups for veterans:**

Various versions of support groups for veterans with SUD have been recommended (SAMHSA, 2005; U.S. Department of Veterans Affairs, 2019b), from the more popular 12-step programs like Alcoholics Anonymous (AA) and Narcotics Anonymous (NA) to the lesser known programs like SMART Recovery (Self-Management And Recovery Training), Cocaine Anonymous Online, Crystal Meth Anonymous, and Marijuana Anonymous. A review of the literature revealed that the most commonly researched support groups for veterans with SUD include Alcoholics Anonymous (AA) and Narcotics Anonymous (NA) (SAMHSA, 2005;
Emrick & Beresford, 2016; Loder, 2009). Therefore, only studies focused on 12-Step recovery groups were included in this meta-analysis.

Alcoholics Anonymous was the original abstinence-based, twelve-step recovery program established in 1935 (Emrick & Beresford, 2016; Loder, 2009). NA applies the same steps and principles as AA but expands the focus from alcohol to any substance (Emrick & Beresford, 2016; Loder, 2009). The process of working through all 12 steps aims to help participants realize that they have a problem, accept themselves for who they are, work to promote behavior change, and learn to help others. Participant attendance in AA and NA support groups can vary from multiple times a day to as little as once a month depending on the level of involvement the recovering addict or alcoholic requires to not abuse substances (Emrick & Beresford, 2016; Loder, 2009).

Variations exist in studies that assessed the impact of AA and NA support group attendance by veterans with SUD. Specifically, some articles only assessed the impact of a support group on the veterans being evaluated while others used a comparison group of non-veterans to determine differential impact (Galanter, Dermatis & Sampson, 2014; Bonn-Miller, Zvolensky & Moos, 2011; Grant, Young, Tyler, Simpson, Pulido & Timko, 2018; Mankowski, Humphreys, & Moos 2001; Worley, Tate, McQuaid, Granholm, & Brown, 2013). Additionally, studies of support groups varied in their focus on substances being used. Some focused on alcohol and other drugs (Grella, Stein, Weisner, Chi, & Moos, 2010) while others focused on a specific substance such as marijuana (Bonn-Miller, Zvolensky & Moos, 2011) and cocaine (McKay, Merikle, Mulvaney, Weiss, & Koppenhaver, 2001).

**Support group variations:**

One variation noted in the literature on support groups for veterans with SUD was the use of comparison groups of veterans against non-veterans versus focusing on a sample that strictly
consisted of veterans. For example, Galanter, Dermatis & Sampson (2014) compared 172 veterans to 336 non-veterans (M = 46.88 years, SD = 12.10 years) who attended Narcotics Anonymous meetings. It was found that veterans were more likely to be professionally referred than non-veterans (77% to 27% respectively). Veterans were less likely to have a sponsor (18% vs. 6%, respectively) and they were less likely to attend more than 200 meetings in the last year (29% vs. 35%, respectively). Additionally, veterans were less likely to experience a spiritual awakening (81% vs. 89%, respectively), or perform NA service in the last year (88% vs. 97%, respectively) (Galanter, Dermatis & Sampson, 2014). Overall, veterans were found to be less active in NA, they were sponsored less, and attended fewer meetings. However, despite having less investment in the NA program, they were not shown to have a higher relapse rate than non-veterans.

While Galanter, Dermatis & Sampson (2014) compared veterans to non-veterans, Worley, Tate, McQuaid, Granholm, & Brown (2013) strictly studied a sample of veterans (N = 201) with SUD and comorbid major depressive disorder (MDD). They assessed veteran’s rates of involvement in 12-step support groups, utilizing posttreatment follow-up data from a study of group Twelve-Step Facilitation (TSF) (N = 97) and integrated cognitive-behavioral therapy (ICBT) (N = 107) for veterans with SUD and MDD. The TSF group members showed a higher rate of 12-step meeting attendance at posttreatment testing as compared to the ICBT group. Although at the one-year assessment, the TSF group showed a significant decrease in meeting attendance and ended with similar levels as those in the ICBT group. This reduction in meeting attendance was shown to correlate with an increase in drinking frequency (Worley, Tate, McQuaid, Granholm, & Brown, 2013).

Some efficacy studies of support groups for veterans also varied in their focus on a particular substance, including marijuana and other drugs (Bonn-Miller, Zvolensky & Moos,
Worley, Tate, McQuaid, Granholm & Brown, 2013). For example, Bonn-Miller, Zvolensky & Moos (2011) examined the link between 12-step support group attendance by veterans following SUD treatment and remaining abstinence from cannabis use. Follow-up assessments were conducted at 12, 24, and 60-month intervals post-treatment. The study consisted of 1288 male veteran patients who used cannabis prior to admission to treatment and discontinued use once treatment was completed. The 12-step support group attendance was significantly related to increased rates of abstinence at each follow-up interval. Analyses also indicated that support group attendance was significant for the return to abstinence after relapse.

The review of the literature revealed nine outcome studies addressing the efficacy of support groups in the treatment of SUD among veterans. Research primarily focused on the efficacy of AA and NA groups. Some studies focused on a sample of veterans while others compared veterans to non-veterans. Some studies focused on a single substance, such as marijuana, while others addressed a wide range of substances utilized by the veterans included in the research. Because the studies were conducted after 2000, were quantitative in nature, included appropriate sample sizes, and reported outcomes in a complete manner, CBT groups for veterans with SUD are included in the proposed meta-analysis.

**Rationale for Current Study**

The review of the literature revealed a multitude of group approaches to treating veterans with SUD. While many descriptive and empirical articles exist, the meta-analysis worked to uncover the approach that has the greatest efficacy. This meta-analysis and systematic review explored various types of group approaches to treating veterans with substance use disorders and determinants of positive impact. Based on the review of the literature and relevant research, empirical studies addressing psychoeducational, cognitive behavioral and support groups used in the treatment of veterans with SUD were included in this meta-analysis due to their prevalence.
The following questions guided the research: Which group therapy modality produced the highest levels of efficacy in veteran populations with substance use disorders? and Which factors influenced group efficacy outcomes in veteran populations with substance use disorders? This analysis extends our understanding of the effectiveness of particular group approaches to treating SUDs in veterans as potential stand-alone treatment possibilities or as an integral part of an integrated treatment program. This knowledge contributes to a growing body of evidence-based treatment, provides information about the potential viability of lower cost treatments, and increased our knowledge about the efficacy and efficiency of treatment alternatives commonly found in these groups.
Chapter 3  
Methodology

This chapter provides a thorough description of the methodological design used for conducting this meta-analysis and systematic review of literature addressing the use of group therapy in treatment of substance use disorder within veteran populations. The chapter will begin by framing the purpose for this research followed by stating this study’s research questions. An historical overview of meta-analyses will be presented as well as a breakdown of the steps required to complete this study. The study’s eligibility and inclusion criteria, and efforts to address internal and external validity will also be discussed. The chapter will conclude with a brief overview of the study.

Purpose of Research

This meta-analysis will add to the body of knowledge about the use of psychoeducational, CBT, and support group therapies in the treatment of veterans who have substance use issues. To date, the literature has revealed both descriptive and empirical articles exploring the use of varying group approaches to treatment. However, very few, if any, empirical articles exist addressing skills development and interpersonal process groups for veterans with SUD. Therefore, this study focused on psychoeducational, CBT, and support groups, which are better represented in the literature through empirical studies. While studies exist indicating efficacy in the use of these group formats in the treatment of veterans with SUD, no meta-analysis has been conducted to assess key aspects of these group approaches to treatment. Among these group approaches to treatment, there is a clear need to distill the existing data down to a set of “best practices” for the group treatment of veterans with substance use issues. This knowledge contributed to evidence-based treatment, provided information about the viability of lower cost treatments such as group therapy, provided a framework for information
dissemination, and increased our knowledge about the efficacy and efficiency of using these groups in the treatment of veterans with SUD. This meta-analysis addressed the following research questions:

**Question One**

What are viable treatment outcomes for psychoeducational, CBT, and support groups of veterans with SUDs?

**Question Two**

What are the measures that capture outcomes related to psychoeducational, CBT, and support groups of veterans with SUDs?

**Meta-Analysis Defined**

A meta-analysis has been described as, “A statistical analysis that combines or integrates the results of several independent clinical trials considered by the analyst to be ‘combinable’” (Huque, 1988, p. 28). The process of meta-analysis entails the systematic synthetization of a number of independent studies into a larger, overarching study. This combined, larger view of the data can yield a higher statistical power and work to flush out patterns in the data as well explain contradictory findings (Lipsey & Wilson, 2000; Russo, 2007; Shin, 2017; Slaney, Tafreshi, & Hohn, 2018). Meta-analysis can be seen as a form of quantitative data synthesis in which, instead of conducting surveys and studies, the researcher surveys the literature instead of surveying participants directly (Lipsey & Wilson, 2000).

The earliest recorded use of the term “meta-analysis” was in 1976 by a statistician named Gene Glass during his presidential address to the American Educational Research Association. Glass felt the use of the term to be apropos, for it literally translates to “the analysis of analyses” (Lipsey & Wilson, 2000). However, by delving further into history, we discover the first actual use of the approach now call meta-analysis to have been when Karl Pearson used existing data
sets to establish better efficacy results for typhoid vaccinations in 1904 (O’Rourke, 2007). Over the following years, the practice of combining studies grew in popularity, to include Ronald Fisher’s work on establishing the effectiveness of crop fertilizers in the 1920s, and Joseph Rhine’s work exploring the results of 145 reports on Extra Sensory Perception (ESP) between 1882 and 1939. These studies demonstrated that combining conceptually identical experiments can further validate results (Rhine, 1940).

The modern meta-analysis is a highly useful tool in summarizing bodies of research, conceptualizing empirical questions, and assisting in informed decision making. A meta-analysis can be seen as a quantitative approach to a literature review. Unlike traditional literature reviews, a meta-analysis can uncover meaningful questions about the data and test these questions statistically. The statistics generated in a meta-analysis are derived from the data collected from independently conducted studies and through an aggregating of the results (Glass, McGaw, & Smith, 1981). Meta-analysis holds promise when dealing with potentially conflicting results, and it dispenses with the need to determine the viability of one study over another. Additionally, meta-analysis can incorporate new information and new studies with the existing body of knowledge and create a more refined and evolving sense of the current available data (Glass, McGaw, & Smith, 1981; Lipsey, & Wilson, 2000). The primary purpose of a meta-analysis is to align study outcomes in a pre-described manner that uses effect size measures that reflect the strength of association between its variables (Slaney, Tafreshi, & Hohn, 2018; Russo, 2007). Meta-analysis can vary greatly in format and function, however, there are in general, nine steps that all meta-analyses follow. This nine-step framework is referred to as a “simple meta-analysis.”
The Nine Steps of a Simple Meta-Analysis

**Step one.** Framing an answerable research question. This is often accomplished using the Participant-Intervention-Comparator-Outcome (PICO) framework (Schardt et al., 2007). This framework ensures the production of a research question that identifies the population studied (P), the breath or specificity of the intervention used (I), how and to what is this population compared to (C), and how broadly or narrowly are the outcomes that we search (O) (Slaney, Tafreshi, & Hohn, 2018; Russo, 2007).

**Step two.** Conducting a search using various search engines (ProQuest, Pubmed, etc.) and selecting search terms relating to your research question. The search terms that are chosen and the manner in which they are used can drastically impact the study. Search terms should be derived directly from the research questions and these terms should be arranged using either Boolean or Fuzzy Logic (Slaney, Tafreshi, & Hohn, 2018; Russo, 2007). Boolean Logic uses connectors such as “OR”, “AND” and “NOT” to like search terms, while Fuzzy Logic searches are able to locate keywords that are within 5 words of each other (Slaney, Tafreshi, & Hohn, 2018; Russo, 2007).

**Step Three.** Review the titles and abstracts derived from search. Reject articles that do not meet study criterion. In this step a scheme is generated to systematically vet articles that do not meet the specific criteria required. It is important to note that this process must be thoroughly documented to ensure that the study is replicable (Slaney, Tafreshi, & Hohn, 2018; Russo, 2007).

**Step four.** Gather information from selected articles (author, year, population, type of study, etc.). This harvesting of information from the articles should be comprehensive in nature and should include interventions used, comparison conditions, outcomes and scales used (Slaney, Tafreshi, & Hohn, 2018; Russo, 2007).
Step five. Assess the quality and internal validity of each article. This step ensures the quality of the articles selected and guards against poor sample size and selection bias. It also controls for confounding variables (Slaney, Tafreshi, & Hohn, 2018; Russo, 2007).

Step six. Determine the heterogeneity of the final articles. In a meta-analysis there is an assumption that the populations studied come from a somewhat uniform background. When this heterogeneity results from an exhaustive search of the literature, a fixed effects meta-analysis would be used. Conversely, when articles are randomly pulled from a much larger group it would be prudent to conduct a random effects meta-analysis (Slaney, Tafreshi, & Hohn, 2018; Russo, 2007).

Step seven. Construct a forest plot using both fixed and random effects models and access the summary effect size in the form of an Odds Ratio. This is accomplished by first assuming both random and fixed effects models are used. If this is the case, a forest plot is created to capture the effects estimate as it is distributed around the null. Here we are able distinguish between a fixed effects and a random effects meta-analysis. Through plotting representations of each study along the x and y-axis, a confidence interval for the effects estimate can be derived (Slaney, Tafreshi, & Hohn, 2018; Russo, 2007).

Step eight. Determine publication bias and run a funnel plot. One of the final steps that must be taken is to ensure against biases that could impact the study’s conclusions. This step addresses the potential bias created by the systematic exclusion of articles based on less interesting studies, smaller studies, less favorable outcomes, or if greater weight is given to studies with large positive findings. Once these studies’ effect estimates are plotted on a graph around the x-axis and if there is no evidence of publication bias, then the plotted graph should resemble a funnel shape (Slaney, Tafreshi, & Hohn, 2018; Russo, 2007).
Step nine. Finish with subgroup analysis and meta regression. Once the meta-analysis is complete, and the study’s outcomes are reviewed, there may be more data that can be derived from the different characteristics of the population studied. These “subgroups” can be analyzed separately. An example of this would be examining participants over a certain age or perhaps focusing on study results that lasted longer than one year. This type of re-examining of the data and considering the difference in summary effects is referred to as a meta-regression or subgroup analysis (Slaney, Tafreshi, & Hohn, 2018; Russo, 2007).

Present Use of Meta-Analysis

The inclusion, search, and coding procedures for this meta-analysis was implemented using the Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols outlined by PRISMA-P (see Table 1) (Shamseer, Moher, Clarke, Ghersi, Liberati, Petticrew, & Stewart, 2015). The PRISMA-P is a 17-item checklist designed to create a well-defined guideline for conducting systematic reviews and meta-analyses.

History of the PRISMA-P Approach

Prior to 2015, nearly half of all systematic reviews and meta-analyses published (roughly 300 per year between 2008-2010) used no formalized protocol (Moher, Stewart, & Shekelle, 2016; Shamseer et al., 2015). Those that did borrowed protocol standards from either the Joanna Briggs Institute or from Cochrane Campbell Collaborations (Moher, Stewart, & Shekelle, 2016). In an effort to standardize protocols relating to systematic reviews and meta-analyses, 23 international experts attended the 2011 PRISMA-P steering committee in Rockville, MD, USA (Moher, Stewart, & Shekelle, 2016). This group of assorted systematic review methodologists, journal editors, biostatisticians, information specialists, health research funders and reporting guideline developers assessed 38 overlapping tools and procedures relating to existing systematic review and meta-analysis protocols (Moher, Stewart, & Shekelle, 2016). These 38 items were
then distilled down into a 22-item draft that was submitted to the Agency for Healthcare Research and Quality’s (AHRQ’s) Learning Network for further review. Once returned, the steering committee made their final edits that resulted in today’s PRISMA-P 2015 17-item checklist that was arranged into 3 categories: administrative information, introduction, and methods (See Table 1)(Moher, Stewart, & Shekelle, 2016).

**PRISMA-P 2015**

Within the PRISMA-P 2015 17-item checklist, there exists three sections: administrative information, introduction, and methods. The administrative information section contains identifying information such as type of overall study (systematic review, meta-analysis or both), names of sponsoring agencies, sources of research funding, authors names and affiliations and contact information, as well as a complete listing of protocol contributions (Moher, Shamseer, Clarke, Ghersi, Liberati, & Petticrew, 2015). In this section, all manner of support (financial or otherwise) must be listed. In addition to the type of support given, the sponsor/funder’s roles in the study must also be disclosed (Moher, et al., 2015). This administrative information section is then followed by the introduction.

The introduction section establishes the groundwork for a robust understanding of the rationale for the study. It also presents how the potential data may impact what is already known. This section may also contain varying perspectives on the research question and include what limitations previous studies may have been bound to. The section outlines objectives being addressed as they relate to interventions used, participant comparisons, study designs, and outcomes. The introduction leads to the methods section.

The methods section contains the bulk of the study’s collected information. It begins with an account of eligibility criteria and information resources followed by outlining how the data will be collected and managed. Finally, the method in which the data will be quantitatively
synthesized is documented, as well as the proposed process for meta-regression, subgroup analyses and assessing for bias. The work as a whole is then assessed for strength through the culmination of evidence (Moher, et al., 2015).

Eligibility Criteria

Only studies that included the use of psychoeducational, CBT, and support groups/interventions in the treatment of veterans with SUD was considered. Studies included manuscripts published in English after the year 2000. In order to conduct a meta-analysis, the primary sources must include the sample size, mean, and standard deviation for each outcome variable (Borenstein, Hedges, Higgins, & Rothstein, 2009). Therefore, only quantitative research designs that reported enough data to calculate effect sizes were included. Efforts were made to include unpublished works in the forms of dissertations, and thesis papers. If the same author or groups of authors were identified in the course of the search, emails would have been sent to solicit data from any unpublished work.

Manuscripts were excluded from the systematic review and meta-analysis if they are published before 2000, were not in English, and/or had insufficient data to calculate an effect size. Therefore, qualitative, conceptual, and descriptive works were not included. Studies that only used participant satisfaction as an outcome variable were also excluded as well as any studies where the outcome was incomplete or not included.

Information Sources and Search Strategy

Studies were selected through searches of computerized databases including, but not limited to, Google Scholar, Medline, Psych Articles, Psych Info, Pub Med, Science Citation, and Science Direct. Key terms were identified from a preliminary database search and then refined using Boolean operators (e.g., AND, OR, NOT, and AND NOT) to extend or narrow the number of manuscripts that were considered.
Study Records

A spreadsheet was created in order to organize records by authors, title, participants, treatment groups, and outcome variables. The PRISMA-P flow diagram (Appendix A) was used to visually represent the search process and subsequent narrowing of the article pool considered. Once search terms were entered in the database, titles and abstracts were reviewed to determine if basic inclusion criteria were met. When an article passed the screening process, the full text was examined, and data extracted.

Data was coded and extracted for qualitative data analysis and then incorporated into this mixed-method design. For the purposes of this project, the systematic review identified salient variables in the Methods and Results sections of selected manuscripts (e.g., participants, definitions of groups, outcome measures, means, standard deviations, etc.). Additionally, data can be exported to statistical software for later analysis (Comprehensive Meta-Analysis – 3 software). Depending on the data available in the manuscripts, either Cohen’s $d$, or Hedges’ $g$ was calculated (Borenstein et al., 2009).

Consideration of Threats to External Validity

External validity addresses a study’s transferability and generalizability to other contexts (Creswell, 2014). Meta-analyses typically strengthen external validity by pooling sample size data and thus, increasing statistical power (Creswell, 2014). Additionally, inclusion of studies spanning many years of published articles also aims to reduce threats to external validity (Chalmers, 1989). However, external validity may be threatened due to the inclusion of unpublished studies that have not gone through a rigorous peer review process. The proposed study will assess validity of any unpublished studies included to prevent threats to external validity.
Consideration of Threats to Internal Validity

Adherence to the PRISMA-P will aim to mitigate threats to the study’s internal validity. Through following this standardized approach to conducting a meta-analysis, a strong framework will be established to increase the study’s internal validity and confidence in the results. This includes identifying research questions based on the reviewed literature, selecting articles in a purposeful manner, and assuring that the studies selected utilized valid approaches to research to reduce Type 1 errors (Creswell, 2014).

Conclusion

This chapter thoroughly reviewed the methodology for this study. A historical perspective of the meta-analysis process was followed by a detailed account of the protocol used in a standard meta-analysis. This study’s chosen format, the PRISMA-P 2015, was described in detail. The chapter closes with a description of efforts that will be taken to address external and internal threats to validity. The following chapter discusses the study’s results.
CHAPTER 4

Introduction

Veteran populations have shown to be particularly susceptible to SUD (NIH, 2019; SAMHSA, 2017) and group therapy is commonly used in their treatment (SAMHSA, 2019; SAMHSA, 1997; Stinchfield, Owen & Winters, 1994). The purpose of this systematic review and meta-analysis was to determine viable outcomes for use of psychoeducational, CBT, and twelve-step support groups in the treatment of veterans who have SUDs. Chapter one provided an overview of the problem and introduced the study. Chapter two reviewed pertinent literature and offered a rationale for the current study. Chapter three detailed the research methodology employed in the study and this chapter will present the results of the research. Evidence of strict adherence to the PRISMA-P and a review of each study included in the analyses will be provided. Findings from the systematic review and meta-analysis will be delineated.

Results

The purpose of this systematic review and meta-analysis was to determine viable outcomes for use of psychoeducational, CBT, and twelve-step support groups in the treatment of veterans who have SUDs. Research exists demonstrating the positive impact of various group treatment approaches for this population, but no meta-analysis has been conducted to assess overall effectiveness. The present study aimed to fill this gap. This chapter describes the results of the systematic review and meta-analysis in response to the following research questions:

Research question 1- What are viable treatment outcomes for psychoeducational, CBT, and support groups of veterans with SUDs?

Research question 2- What are the measures that capture outcomes related to psychoeducational, CBT, and support groups of veterans with SUDs?
Following, the effects of the CBT and twelve-step support groups on promoting abstinence and improving familial and social variables will be provided. The inclusion, search, and coding procedures for this systematic review and meta-analysis will be presented using the Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (PRISMA-P) (Shamseer, Moher, Clarke, Ghersi, Liberati, Petticrew, & Stewart, 2015). The PRISMA-P checklist is represented graphically in the PRISMA-P Flow Chart located in appendix B.

**Rationale**

The literature review showed that most studies included heterogenous groups of veterans addressing issues pertaining to various substances as opposed to homogenous groups of veterans with addictions specific to a particular substance, such as alcohol or marijuana. As such, this study included research addressing veterans with any type of SUD, as defined by the Diagnostic and Statistical Manual-5 (American Psychiatric Association, 2013). The literature revealed both descriptive and empirical articles exploring the use of varying group approaches to treatment. This study focused on psychoeducational, CBT, and support groups, which are represented in the literature through empirical studies. While studies existed indicating efficacy in the use of these group formats in the treatment of veterans with SUD, no meta-analysis had been conducted to assess key aspects of these group approaches in treatment. Among these group approaches to treatment, there was a clear need to distill the existing data down to a set of “best practices” for the group treatment of veterans with substance use issues. This knowledge could contribute to evidence-based treatment, provide information about the viability of lower cost treatments such as group therapy, provide a framework for information dissemination, and increase our knowledge about the efficacy and efficiency of using these groups in the treatment of veterans with SUD.
Data Selection

Eligibility Criteria

Seven eligibility criteria were identified to increase the power of the study and ensure all included articles were addressing the same subject. Criterion 1 stipulates that all manuscripts must involve the veteran population and focus on recovery from substance use issues as outlined in the DSM 5. Criterion 2 limited the publication years to 2000-2020. This guideline was recommended in the APA (2016) standards for conducting up-to-date research, served to be vital in truncating the overall number of articles discovered, and ensured that each article followed the same research protocol used within this meta-analysis. Criterion 3 required all articles utilize either a psychoeducational, CBT, or support group methodology. This was set to continue to build uniformity of the articles included in this study and the specific group types were established through a review of the existing literature. Criterion 4 required that all manuscripts be quantitative research designs that reported enough data to calculate effect sizes. Criterion 5 ensured that the articles included sample size, mean and standard deviations (see Appendix for a full list of articles that were excluded as a result of insufficient data). The sample size, mean, and standard deviation were required as this data is necessary for computing Cohen’s d for a meta-analysis, which provides a standardized score to report the findings. Criterion 6 restricted the use of other meta-analyses in this study. Criterion 7 required that all articles be published in English.

Information Sources

Studies were selected through searches of the following seven computerized databases: Academic Search Complete, Medline, Psych Articles, Psych Info, Pub Med, Science Citation, and Science Direct. These computerized databases where selected along with Keyword search terms from a preliminary database search using Google Scholar and expertise in the field. The identified Keyword search terms where then further refined using Boolean operators (e.g., AND,
OR, NOT, and AND NOT) to extend and then narrow the number of manuscripts that were considered. Additional articles were identified through a search of reference lists from studies identified in the computerized databases.

**Search Strategy**

A literature search using the key terms *veteran, military, service member, substance use, substance abuse, addiction, drug addiction, drug use, alcohol use, and alcoholism* produced over 8,000 articles. Only studies that included the use of psychoeducational, CBT, and support groups/interventions in the treatment of veterans with SUD were considered. These studies included manuscripts published in English after the year 2000. In order to be included in this meta-analysis, the primary sources must have included the sample size, mean, and standard deviation for each outcome variable (Borenstein, Hedges, Higgins, & Rothstein, 2009). Therefore, only quantitative research designs that reported enough data to calculate effect sizes were included. Efforts were made to include unpublished works in the form of dissertations and thesis papers.

Manuscripts were excluded from the systematic review and meta-analysis that were published before 2000, were not in English, and/or had insufficient data to calculate an effect size. Therefore, qualitative, conceptual, and descriptive works were not included. Studies that only used participant satisfaction as an outcome variable were also excluded as well as any studies where the outcome was incomplete or not included. Table 1 shows the number of articles remaining after each of the criteria was applied to the selection of articles. The selection process produced a total of 14 articles that met the eligibility criterion for the systematic review and 5 articles that met the eligibility criterion for the meta-analysis.
Table 1.a

Systematic Review Inclusion Criteria

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<th>Inclusion Criterion</th>
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<tr>
<td>Criterion 1</td>
<td>Veteran Population with Substance Use Issues</td>
<td>8,059</td>
</tr>
<tr>
<td>Criterion 2</td>
<td>Published between 2000-2020</td>
<td>7,492</td>
</tr>
<tr>
<td>Criterion 3</td>
<td>Use Group Therapy (Psychoeducational, CBT or Support Group)</td>
<td>181</td>
</tr>
<tr>
<td>Criterion 4</td>
<td>Utilized quantitative methodology</td>
<td>63</td>
</tr>
<tr>
<td>Criterion 5</td>
<td>Sufficient data reported ($n$, Mean’s, SD)</td>
<td>14</td>
</tr>
<tr>
<td>Criterion 6</td>
<td>No Meta-analysis</td>
<td>14</td>
</tr>
<tr>
<td>Criterion 7</td>
<td>Published in English</td>
<td>14</td>
</tr>
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</table>

Table 1.b

Meta-Analysis Inclusion Criteria

<table>
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<td>Utilized quantitative methodology</td>
<td>63</td>
</tr>
<tr>
<td>Criterion 5</td>
<td>Sufficient data reported ($n$, Mean’s, SD, effect size)</td>
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</tr>
<tr>
<td>Criterion 6</td>
<td>No Meta-analysis</td>
<td>5</td>
</tr>
<tr>
<td>Criterion 7</td>
<td>Published in English</td>
<td>5</td>
</tr>
</tbody>
</table>

Study Records

Data Management

All records were preserved through End Note, Excel spreadsheets, and Comprehensive Meta-Analysis Software 3.

Selection process

Information sources were searched and assessed for inclusion, facilitated by grading each eligibility criterion as eligible/not eligible (van Tulder et al, 2003). The full text of each study was reviewed, and the study was considered potentially relevant when it could not be clearly excluded using the afore mentioned 7 criteria (CRD, 2009). The considered manuscripts were
further reviewed for consistency by a secondary reviewer. A study was included when both reviewers independently assessed it as satisfying the inclusion criteria from the full text. A third reviewer was available to mediate in the event of disagreement following discussion (Furlan et al, 2009).

**Data collection process**

Using a standardized form, the primary and secondary reviewers extracted the data independently (CRD, 2009). A third reviewer independently checked the data for consistency and clarity. Risk of bias for each included trial was independently assessed by the same initial reviewers. The third reviewer was available to mediate situations of disagreement (Deeks et al., 2003).

Data were presented in tabulated form to allow for semi qualitative comparison of sample size, number of sessions, duration of study, study outcomes, and measures of success. These were grouped according to outcomes to evaluate across studies. The strength of this meta-analysis was assessed using Grading of Recommendations, Assessment, Development and Evaluation (GRADE).

**Analyses**

Fourteen articles from the database search and reference search met criteria for the systematic review. Of these, 4 addressed CBT groups, 4 addressed support groups, 1 addressed a combination of CBT and psychoeducational groups, and 5 addressed a combination of CBT and support groups. Data addressing results from 10 CBT groups, 9 support groups, and 1 psychoeducation group was included in the systematic review. Of the 14 articles included in the systematic review, five also met criteria for the meta-analysis. Of these, 2 addressed CBT groups, 1 addressed support groups, and 2 addressed a combination of CBT and support groups.
Consequently, data addressing results from 4 CBT groups and 3 support groups was included in the meta-analysis.

The majority of studies that did not qualify for the systematic review and meta-analysis were for two reasons (1) insufficient data was provided to calculate Cohen’s $d$, and (2) results were not provided specific to the treatment group. Desai et al. (2008) contained the only psychoeducational group study that met the required criteria. It was included in the systematic review but could not be included in the meta-analysis because the data was not replicable to the data in the other studies included in the meta-analysis. All the support group studies that met the established search criteria referenced 12-Step Recovery groups and are often referred to as Twelve Step Facilitation (TSF) and for the purposes of this study, support groups, 12-Step recovery groups and TSF are all used interchangeably. Additionally, within this study Cognitive Behavioral Therapy (CBT) includes Integrated Cognitive Behavioral Therapy (ICBT) and Cognitive Processing Therapy (CPT).

**Included Studies and Samples**

A total of 3700 veterans with SUD were included in the systematic review. Participants included males ($n = 3219; 87\%$) and females ($n = 481; 13\%$) with an average age of 47.2 years old with a standard deviation of 3.9. A total of 704 veterans with SUD were included in the meta-analysis. Participants included males ($n = 497; 80\%$) and females ($n = 126; 20\%$) with an average age of 47.38 years old with a standard deviation of 9.3. Table 1 details the number of participants for each study by treatment group (TSF vs. CBT), including the gender percentages of each group.
<table>
<thead>
<tr>
<th>Author</th>
<th>Group Type</th>
<th>N</th>
<th>Age (SD)</th>
<th>Female</th>
<th>Male</th>
<th>Total N</th>
</tr>
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<tbody>
<tr>
<td>Bonn-Miller et al. (2011)</td>
<td>TSF</td>
<td>1288</td>
<td>39.3 (7.3)</td>
<td>0</td>
<td>100%</td>
<td>1288</td>
</tr>
<tr>
<td></td>
<td>CBT</td>
<td>n/a</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brown et. al (2006)</td>
<td>TSF</td>
<td>29</td>
<td>48.9 (7.6)</td>
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<td>90%</td>
<td>66</td>
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<tr>
<td></td>
<td>CBT</td>
<td>37</td>
<td>49.1 (6.8)</td>
<td>5%</td>
<td>95%</td>
<td></td>
</tr>
<tr>
<td>Cook et. al (2006)</td>
<td>TSF</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>CBT</td>
<td>18</td>
<td>50</td>
<td>28%</td>
<td>72%</td>
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<tr>
<td>Desai et. al (2008)</td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CBT</td>
<td>91</td>
<td>45.5 (7.2)</td>
<td>100%</td>
<td></td>
<td>91</td>
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<tr>
<td>Galanter et. al (2014)</td>
<td>TSF</td>
<td>172</td>
<td>53.3 (9.2)</td>
<td>9%</td>
<td>91%</td>
<td>508</td>
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<tr>
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<td>CBT</td>
<td>n/a</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Granholm et. al (2011)</td>
<td>TSF</td>
<td>74</td>
<td>49.1 (8.1)</td>
<td>7%</td>
<td>93%</td>
<td>164</td>
</tr>
<tr>
<td></td>
<td>CBT</td>
<td>90</td>
<td>49.1 (7.0)</td>
<td>16%</td>
<td>84%</td>
<td></td>
</tr>
<tr>
<td>Grant et. al (2018)</td>
<td>TSF</td>
<td>195</td>
<td>46.9 (12.3)</td>
<td>9%</td>
<td>91%</td>
<td>195</td>
</tr>
<tr>
<td></td>
<td>CBT</td>
<td>n/a</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Haller et. al (2016)</td>
<td>TSF</td>
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<td></td>
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<tr>
<td></td>
<td>CBT</td>
<td>146</td>
<td>47.3 (12.0)</td>
<td>11%</td>
<td>89%</td>
<td>146</td>
</tr>
<tr>
<td>Kaysen et. al (2014)</td>
<td>TSF</td>
<td>n/a</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>CBT</td>
<td>479</td>
<td>37.7 (14.0)</td>
<td>5%</td>
<td>95%</td>
<td>479</td>
</tr>
<tr>
<td>Lydecker et. al (2010)</td>
<td>TSF</td>
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<td>48.4 (8.1)</td>
<td>8%</td>
<td>92%</td>
<td>206</td>
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<tr>
<td></td>
<td>CBT</td>
<td>107</td>
<td>48.0 (7.5)</td>
<td>8%</td>
<td>92%</td>
<td></td>
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<tr>
<td>McGuire et. al (2018)</td>
<td>TSF</td>
<td>n/a</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CBT</td>
<td>29</td>
<td>49.1 (11.2)</td>
<td>0</td>
<td>100%</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>TSF</td>
<td>132</td>
<td>41</td>
<td>0</td>
<td>100%</td>
<td>132</td>
</tr>
</tbody>
</table>
### Study Characteristics

Manuscripts that met the established criteria provided characteristics such as population demographics, objectives, study design and primary outcomes. An overview of each manuscript included in the systematic review ($n = 14$) and meta-analysis ($n = 5$) is provided below. Those included in just the systematic review are presented first, followed by those included in both the systematic review and meta-analysis.

**Systematic Review**

In 2011, Bonn-Miller and his associates assessed 1288 veterans after being discharged from a VA SUD treatment center. All participants in this study had a history of marijuana abuse. The veterans were all male with an average age of 39 years with the following racial composition: 58.2% African American, 37.1% Caucasian, 2.5% Hispanic or Latino and 0.1% Asian. At the time of discharge 35% of the sampled population held an additional mental health diagnosis (PTSD, MDD, etc.). This study’s assessments occurred post treatment at the 1-year, 2-year and 5-year marks and focused on the effects of 12-Step meeting attendance on the patient’s ability to remain abstinent from marijuana. The study used a self-report survey that queried the number of 12-Step meetings attended and the amount of marijuana use in the last 90 days prior to the assessments. Participants’ attended an average of 10.7 meetings (13.4 SD) in the 90 days preceding the first year. For the 2\textsuperscript{nd} year, participants attended an average of 9.2 (12.6 SD)

<table>
<thead>
<tr>
<th></th>
<th>Treatment</th>
<th>n/a</th>
<th>Outcome Measure</th>
<th>1-Year Follow-up</th>
<th>2-Year Follow-up</th>
<th>5-Year Follow-up</th>
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<td></td>
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<tr>
<td>Worley et. al (2013)</td>
<td>TSF</td>
<td>113</td>
<td>49.2 (7.6)</td>
<td>10%</td>
<td>90%</td>
<td></td>
<td>242</td>
</tr>
<tr>
<td></td>
<td>CBT</td>
<td>129</td>
<td>48.9 (7.8)</td>
<td>10%</td>
<td>90%</td>
<td></td>
<td></td>
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<tr>
<td>Worley et. al (2012)</td>
<td>TSF</td>
<td>109</td>
<td>48.2 (2.0)</td>
<td>10%</td>
<td>90%</td>
<td></td>
<td>237</td>
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<tr>
<td></td>
<td>CBT</td>
<td>125</td>
<td>48.2 (2.0)</td>
<td>10%</td>
<td>90%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
meetings and for the 5th year, they attended an average of 7.8 (12.3 SD) in the 90 days preceding data collection. Correlations between the predictor (meeting attendance) and criterion (abstinence) were used in a logistic regression analysis to compare 1 to 2 to 5-year follow-ups. Correlations: 1 yr (r=0.18**); 2 yr (0.20**); 5 yr (0.18**); logistic regression analyses (controlling for higher levels of marijuana use at intake, age and psychiatric disorder): 1 yr (Exp(B) = 1.03, 95% CI=1.02–1.05**); 2 yrs (Exp(B) = 1.04, 95% CI=1.03–1.06**); 5 yr (Exp(B) = 1.05, 95% CI= 1.03–1.06**) and **p<0.0. This suggested that attendance in 12-Step meetings was shown to increase abstinence at the 1, 2 and 5-year intervals. Due to a lack of transferability in the measures used in this study, it was included in the systematic review but not used in the meta-analysis.

In 2006, Cook and her team assessed CBT group treatment for veterans suffering from SUD and PTSD. Their study included 18 veterans of whom 72% were male and 100% were diagnosed with PTSD. Their mean age was 50, and they reported SUD history with alcohol, cocaine, and heroin. The patients received between 18 to 25 sessions of CBT over the course of 14 months. Pre and post-data was gathered through the use of the PTSD Military Checklist and the Quality of Life Inventory. Lengths of absence were confirmed through random Urine Drug Screens (UDS). PTSD symptoms decreased, as measured by the PTSD Military Checklist: Pre M = 65.54, SD = 8.80; post M = 51.15, SD = 14.38, t (12) = 6.60, p < .001. Quality of Life increased, as measured by the Quality of Life Inventory: Pre M = -15.43, SD = 20.82, very low; post M = -2.29, SD = 18.38, low, t (6) = -2.46, p < .05. Veterans reported increase in communication and problem-solving skills as well as continued abstinence throughout treatment. Due to a lack of transferability in the measures used in this study, it was included in the systematic review but not used in the meta-analysis.
A study conducted in 2014 by Galanter, Dermatis & Sampson assessed the efficacy of Narcotics Anonymous (NA) meetings (12-Step recovery) on veterans with SUD and PTSD and compared them to non-veterans attending Narcotics Anonymous meetings. The study included a total of 508 participants with 172 of them veterans. The median age of veterans was 53.27 years (SD=9.19) with 91% of them being male. The median age of non-veterans was 46.88 years (SD=12.10) with 70% of them being male. Data was collected through a self-report 42-item survey that included an additional 23 items for veterans, as well as a Brief Symptom Survey. Results indicated that veterans were less involved in the NA recovery program. Veterans were more likely to never have a sponsor than non-veterans (18% vs. 6% respectively). Veterans were less likely to attend more than 200+ meetings per year than non-veterans (29% vs. 35% respectively). Additionally, veterans were less likely to experience a spiritual awakening or perform service work. However, abstinence rates for non-veterans averaged 104.9 (114.9 SD) months compared to 104.3 (111.9 SD) months for veterans. This indicated that despite less NA involvement there was no significant difference in abstinence rates between veterans and non-veterans. Due to a lack of transferability in the measures used in this study, it was included in the systematic review but not used in the meta-analysis.

A team led by Granholm in 2011 compared TSF group treatment with CBT group treatment on veterans with SUD and Major Depression Disorder (MDD). Overall, the study contained 164 veterans with 74 participating in TSF groups and 90 participating in CBT groups. The median age in the CBT group was 49.1 years (SD=7 years) and was 84% male with 70% Caucasian. The TSF group had a median age of 49.1 years (SD=8.1 years) and was 93% male with 78% Caucasian. The first phase of this study consisted of 2 sessions per week for 12 weeks. The second phase consisted of 1 session per week for 12 weeks. The study contained 36 sessions over a 24-week period. Assessments were then given every 3 months up to one year after
treatment. Total length of the study was 18 months. Data was collected pre- and post-treatment and at 3-month intervals using TLFB, ASI and the Hamilton Depressive Rating Scale. Both groups (CBT&TSF) reported a decrease in substance use. The CBT groups appeared to maintain improvements made over time, while TSF group members appeared to increase substance use more rapidly after conclusion of treatment. Due to a lack of transferability in the measures used in this study, it was included in the systematic review but not used in the meta-analysis.

In 2014, Kaysen and associates completed a study to assess the efficacy of Cognitive Processing Therapy (CPT) on veterans with PTSD and Alcohol Use Disorder (AUD) compared to veterans with PTSD only. The study consisted of 536 veterans: 272 with PTSD and no history of AUD, 207 with PTSD and a history of AUD, and 99 with PTSD and a current history of AUD. The study’s population demographics were as follows: average age of participants was 48.2 years (SD=7.7 years), 94.7% were male, 82.5% were Caucasian, and 17.5% were African American. The study was conducted over a 12 week period with 12, 1-hour sessions. Data was assessed through the use of a Structured Clinical Interview, PTSD Checklist, and the Beck Depression Inventory and collected through pre- and post-treatment interventions. The data indicated that there were no significant differences in PTSD symptom reduction due to AUD status. Additionally, there were significant reductions in depression symptoms over time and again, no significant effect for AUD status. Due to a lack of transferability in the measures used in this study, it was included in the systematic review but not used in the meta-analysis.

In 2013, McGuire et al. conducted a study to assess whether veterans seeking psychotherapy for comorbid PTSD and SUD reported increased resilience from pre- to posttreatment. The 29 participants in this study had an average age of 49.07 years (SD=11.24), were 100% male and had a racial makeup as follows: 34.5% African American, 34.5% Caucasian, 23.5 Hispanic. This study followed an intensive Cognitive Processing Therapy (CPT)
group that met for 46 sessions within a 6-week period. Pre and post-data was collected as well as follow-up assessments. Instruments used included the Conner-Davidson Resiliency Scale, PTSD Checklist, Alcohol Craving Questionnaire and the Beck Depression Inventory. Results indicated that overall, participants increased resilience and decreased PTSD symptoms. However, no significant decrease in trauma-associated cravings were noted. Due to a lack of transferability in the measures used in this study, it was included in the systematic review but not used in the meta-analysis.

In 2001, McKay et al. conducted a randomized clinical trial that assessed the relationships between predictor variables and cocaine use in addicted veterans as they attended TSF groups. The participant demographics were as follows: 86% African American, 10% Caucasian, 4% other, 100% male, average age of 41 years old. The study administered several assessments including Commitment to Abstinence, Readiness to Change, Drug-Taking Confidence Questionnaire, ASI, and TLFB at the 6, 12, 18, and 24-month marks. The data suggested a reduction in cocaine use in each 6-month period up to the 24-month mark. Due to a lack of transferability in the measures used in this study, it was included in the systematic review but not used in the meta-analysis.

In 2012, Worley et al. assessed the longitudinal association between SUD and major depressive disorder (MDD) in veterans receiving either CBT or TSF group treatment. Overall the study included 237 veterans divided into two groups; 109 assigned to TSF and 125 assigned to CBT groups. The average age for this study was 48.2 years (SD=2.0) with 90.3% identifying as male. The study reported that 70.3% of the participants where Caucasian, 14% were married and reported an average of 13.4 years of education (SD=2.0). All participants reported as history of MDD with 80.9% having issues with alcohol, 57.7% issues with stimulants, and 27.4% issues with cannabis. The first phase of this study included 2 group sessions per week for 12 weeks
followed by phase 2 that met once per week for 12 weeks for a total of 36 session. Follow-ups for both TSF and CBT were assessed post-treatment every 3 months up to one year. Assessment measures included: AA Affiliation Scale, TLFB, and longitudinal analyses utilized latent growth modeling (LGM). Both groups experienced a decreased in frequency of substance used from end of treatment through 6-month mark. From 6 to 18 months there was a gradual increase in frequency of in both TSF and CBT with noted difference being a better response seen in CBT over TSF. Due to a lack of transferability in the measures used in this study, it was included in the systematic review but not used in the meta-analysis.

In 2013, Worley et al. examined group of 242 veterans (n=242) that were used to compare TSF (n=113) group treatment to CBT (n=129) group treatment. The average age of the TSF group of veterans was 49.2 years (SD=4.6) and the CBT group was 48.9 years (SD=7.8) with 90.3% identifying as male. The study reported that 70.3% of the participants where Caucasian, reported an average of 13.4 years of education (SD=2.0). All participants reported as history of MDD with 86.7% having issues with alcohol, 55.2% issues with stimulants, and 28.7 issues with cannabis. The first phase of this study included 2 group sessions per week for 12 weeks followed by phase 2 that met once per week for 12 weeks for a total of 36 session. Follow-ups for both TSF and CBT were assessed post-treatment every 3 months up to one year. Assessment measures included: AA Affiliation Scale, TLFB, and longitudinal analyses utilized latent growth modeling (LGM). Over the course of the one-year follow-up, results indicated that veterans in TSF groups increased in drinking frequency more than veterans in CBT groups. However, greater levels of AA affiliation and 12-step recovery meeting attendance at end-of-treatment were also correlated with drinking less frequently. Due to a lack of transferability in the measures used in this study, it was included in the systematic review but not used in the meta-analysis.
Systematic Review and Meta-Analysis

Brown and colleagues (2006) conducted a randomized clinical trial with veterans that suffered from SUD and depression by enrolling them in one of two types of treatment groups: Twelve Step Facilitation (TSF) or Integrated Cognitive Behavior Therapy (ICBT). A total of 66 veterans with the average age of 49 were assigned to two treatment groups, 29 in TSF and 37 in ICBT. The TSF group contained 26 males and 3 females and held the following racial profile: 70.4% Caucasian, 14.8% Hispanic, 11.1% African American. The ICBT group contained 35 males and 2 females and held the following racial profile; 77.8% Caucasian, 11.1% Hispanic, 11.1% African American. The study consisted of 36 sessions of ICBT and 36 sessions of TSF administered twice a week for the first 12 weeks and then once per week for the remaining 12 weeks. The Addict Severity Index (ASI) was used along with the TimeLine Follow Back (TLFB) to establish a baseline. Average number of drinks per day was gathered through a self-report pre-treatment survey and the Hamilton Depression Rating Scale was administered upon intake. Post-treatment, the ASI and CIDI were administered at 3 months and again at 6 months. Both TSF and ICBT showed initial improvement remaining abstinent, however, maintenance of these improvements appears to be more stable with ICBT.

A study performed in 2008 by Desai and associates assessed 450 homeless female veterans. The study’s focus was on the use of a manualized cognitive-behavioral therapy called “Safety Seeking.” They examined its effectiveness when used with homeless women veterans with psychiatric or substance abuse problems. The first phase of this study contained 359 homeless female veterans that participated in a 6-month intervention that consisted of “treatment as usual” (psychoeducation and case management) with assessments taken every 3 months up to one year. The second phase of this study contained 91 homeless female veterans that also participated in a 6-month psychoeducational intervention followed by a 25 session, 6 month
“Safety Seeking” intervention. Phase 2 was then assessed every 3 months up to one year. Phase 1 of this study contained the following racial profile: Caucasian 33%, African American 53%, Hispanic 8%, Other 6%. Phase 2 contained the following racial profile: Caucasian 42%, African American 46%, Hispanic 3%, Other 9%. The average age in Phase 1 was 43.3 years and in Phase 2 was 45.5 years. Pre, post, and follow-up assessments included the PTSD Military Checklist and the Addiction Severity Index. Overall, the CBT Safety Seeking (Phase 2) reported better outcomes with regard to maintaining employment, social support, and a reduction of PTSD symptoms. The psychoeducation group (Phase 1) reported lower instances of drug and alcohol use. Due to the lack of transferability of data, the psychoeducational group portion (Phase 1) was not included in the meta-analysis, however it was included in the systematic review. The CBT group portion (Phase 2) was included in the systematic review and meta-analysis.

In 2018, Grant and his colleagues assessed the efficacy of TSF groups on 195 veterans that lived in rural areas. The average age of these participants was 46.86 years (SD=12.25 years), 91.3% were male and the racial composition that was provided in the article included the following: 76.9% Caucasian, 5.6% Hispanic. Data collected during the pretest utilized the TLFB, ASI, PTSD Index, and the Alcoholics Anonymous (AA) Affiliation Scale. A posttest was conducted at the 6-month mark utilizing the ASI, PTSD Index, and the AA Affiliation Scale. Results indicated that the average number of AA meetings attended in the 6 months period was 65.26 (SD=72.99). The veterans involved showed significant improvement in measures of substance use and Percentage Days Abstinent: Alcohol= M92.43(SD21.19), Cannabis= M99.95(SD.42), Meth= M100.00(SD.00), Cocaine= M100.00(SD.00). Additionally, there was a significant reduction in the PTSD symptoms experienced.

Haller (2016) compared Integrated Cognitive Behavioral Therapy (ICBT) group treatment to Individual Cognitive Processing Therapy (CPT) and individual ICBT treatment in
the treatment of veterans with SUD, depression and trauma related disorders. The 146 veterans that participated in this study had a median age of 47.26 years (SD=11.97 years), were 89% male and contained the following racial profile: 64.2% Caucasian, 16.2% Hispanic, 9.8% African American, and 4.9% Asian. The study consisted of 2 phases; Phase 1 consisted of 146 veterans receiving 12 weeks of ICBT group treatment that met twice per week and Phase 2 involved the veterans being separated into 2 groups: one that attended 12 sessions of individual CPT treatment and one that attended 12 sessions of individual ICBT treatment. Data was assessed using the TLFB, CIDI, Hamilton Depression Rating Scale, and the PTSD Checklist and was collected pre- and post-Phase 1, post Phase 2, and at 3, 6, 9, and 12-month follow-ups. The ICBT group treatment (Phase 1) reduced the frequency of substance use by two-thirds across all demographics. Additionally, the ICBT group resulted in a significant overall group reduction in severity of PTSD symptoms and a slight decrease in depression symptoms. In Phase 2, the CPT individual treatment led to additional small improvements in PTSD and depression and were maintained until the one-year mark. The Phase 2 ICBT individual treatment led to better maintenance of the substance use gains made form Phase 1.

A study conducted in 2010 by Lydecker et al. examined longitudinal outcomes for veterans with SUD and MDD that were assigned to either CBT group treatment or a TSF group treatment. The study contained 206 veterans (92% male) with an average age of 48.2 years (SD=7.7years) and identified as 71% Caucasian. The veterans were randomly assigned to either a TSF group (n=99) or a CBT group (n=107). Both the CBT and the TSF groups met for 36 sessions over 24 weeks. Data was collected pre- and post-treatment, and every 3 months up to the 1-year post treatment mark through the CIDI, TLFB, Hamilton Depression Rating Scale, ASI, and the AA Affiliation Scale. Overall, the CBT groups were associated with stronger substance use outcomes compared to TSF groups at 12 months post treatment. Reductions in
drinking and drug use remained stable in the year following CBT group treatment while drinking and drug use frequency increased post TSF group treatment.

**Systematic Review Results**

Study characteristics emerged from a thematic analysis of the articles included in the systematic review \((n = 14)\). Initially, each article was coded to extract data related to group factors for veterans with SUD. In particular, group context descriptions and findings were the focus of coding. The codes were grouped logically, and overarching themes emerged. The study characteristics consist of the group type, length of intervention or involvement in group, and the substances targeted for reduction or abstinence. These factors were discussed in every study no matter the varied population or varied setting. Each factor holds important implications for CBT, Psychoeducational, and support groups and in their approaches to treat veterans with SUD. The following are study characteristics that emerged from the thematic analysis:

- **Group type** - Three group treatments were identified through the review of the literature, 1) Twelve-step groups, 2) cognitive behavioral therapy, and 3) psychoeducational groups.

- **Length of intervention or involvement in group** – The length of intervention strategies differed in the amount of time participants were expected to spend engaged in the group experience.

- **Substances targeted for reduction or abstinence** – Different studies targeted participants’ use of various substances.

**Group Type - Twelve-Step Programs vs. Cognitive Behavior Therapy Groups**

Review of the literature indicated that only one study included a psychoeducational group (Desai et. al, 2008) which precluded inclusion for comparison of treatments. Therefore, the experimental groups in the meta-analysis used either a Twelve-step Program or a Cognitive
Behavioral Therapy Group as the intervention for SUDs. Three out of 14 studies used a comparison group. One study used a non-veteran comparison group, another study included non-alcoholic comparison group, and one study compared participants with PTSD and SUDs to a group of participants with PTSD only. Five of the studies included both a CBT and TSF group. For these five studies, results are disaggregated for comparison across manuscripts.

**Length of Intervention or Involvement in Group Meetings**

**Twelve-Step Facilitation Groups (n = 9)**

All TSF groups lasted 1 hour. Four studies followed a format where participants attended meetings twice weekly for a twelve-week period and then once a week for an additional twelve weeks (Brown et. al, 2006; Granholm et al., 2011, Lydecker et. al, 2010; Worley et. al, 2012; Worley et. al, 2013). Bonn-Miller et. al (2011) tracked the number of meetings participants attended by surveying them over the course of five years. Results of one study (Galanter et. al., 2014) were from a single administration of a survey to participants who were currently attending TSF group meetings. One study (Grant et al., 2018) was a pretest-posttest design that followed veterans’ substance use over a six-month period. McKay et. al (2001) followed a group of veterans over a 24-month period with check-ins at every six months.

**Cognitive Behavioral Therapy Groups (n = 10)**

Groups were classified under this heading if they followed the basic tenets of CBT. Therefore, the terms cognitive processing therapy (n = 1), and integrated cognitive behavior therapy (n = 2) were included in this category. As with TSF, all sessions lasted for an hour. Seven studies followed a format where participants attended sessions twice a week for the first 12 weeks and then once a week for the next 12 weeks with data being collected every 3 months for 6 months of treatment and 12 additional months of follow-up (Brown et. al., 2006; Dasai et. al, 2008; Granholm et. al, 2008; Haller et. al, 2016; Lydecker et. al, 2010; Worley et. al., 2012,

**Substances Targeted for Reduction or Abstinence**

The systematic review included 14 studies, 12 of which tracked reduction in use or abstinence from a variety of substances. The two articles that did not address reduction or abstinence, but instead addressed impact of substance use on PTSD (McGuire et. al, 2018) and TSF meeting attendance between veterans and non-veterans (Galanter et. al., 2014), did not contribute to this theme. For the 12 that did produce codes toward the theme, most commonly ($n = 10$), participants reported use of alcohol and additional substances. Kaysen et. al (2014) reported data on participants’ use of alcohol only and McKay et. al (2001) reported outcomes for participants’ use of cocaine only.

**Meta-Analysis Results**

The meta-analysis included 5 studies. The majority of studies that did not qualify for the meta-analysis were for two reasons (1) insufficient data was provided to calculate Cohen’s $d$, and (2) results were not provided specific to the treatment group. Desai et al. (2008) contained the only psychoeducational group study that met the required criteria. It was included in the systematic review but could not be included in the meta-analysis because the data was not replicable to the data in the other studies and its combined effect could not be assessed. A variety of outcome measures were used in the studies and two emerged that had sufficient data for comparison across studies. These addressed outcomes related to TSF and CBT groups. The two measures are detailed in this section.
Timeline Follow Back (TLFB)

The Timeline Follow-Back (TLFB) measure documents the frequency of alcohol and drug use and quantity of alcohol and drug use in the past 30-, 60-, or 90-day segments (Sobell & Sobell, 1992). The TLFB consists of a calendar-assisted structured clinical interview and has been shown to document with validity and reliability substance use in individuals with psychiatric disorders and comorbid alcohol and/or substance dependence. Summary Proportion or Percentage Days Abstinent (PDA) scores can be calculated at each time point. Trajectory analyses examined two substance use outcomes: (1) probability of any alcohol or drug use on a given day, and (2) probability of heavy drinking (5 or more drinks consumed in a day) on a given day (Carey, Carey, Maisto, & Henson, 2004). Investigation into how many days abstinent were reported in individual studies indicated that data was either a proportion or a percentage of days abstinent. Further investigation revealed that percentage data was calculated by multiplying the proportion times 100. Therefore, where Proportion of Days abstinent were reported those data were adjusted by multiplying means and standard deviations by 100 to create a percentage which made results comparable across studies.

Table 3

TLFB TSF Studies Outcomes

<table>
<thead>
<tr>
<th>Study</th>
<th>Pretest</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>Mean</td>
</tr>
<tr>
<td>Brown et al. (2006)</td>
<td>29</td>
<td>68</td>
</tr>
<tr>
<td>Grant et al. (2018)</td>
<td>63</td>
<td>60.9</td>
</tr>
<tr>
<td>Lydecker et al. (2010)</td>
<td>99</td>
<td>70</td>
</tr>
<tr>
<td>Comparison</td>
<td></td>
<td>-0.945</td>
</tr>
</tbody>
</table>
Negative $d$ scores indicate a decrease in PDA when pretest and posttest scores were compared. Results indicate that participants had a greater percent days abstinent following treatment with TSF ($d = -0.945$, SEM = 0.109, $p < 0.0001$).

**Table 4**

**TLFB CBT Studies Outcomes**

<table>
<thead>
<tr>
<th>Study</th>
<th>Pretest</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$n$</td>
<td>Mean</td>
</tr>
<tr>
<td>Brown et al. (2006)</td>
<td>37</td>
<td>74.4</td>
</tr>
<tr>
<td>Haller et al. (2016)</td>
<td>62</td>
<td>47</td>
</tr>
<tr>
<td>Lydecker et al. (2010)</td>
<td>107</td>
<td>75</td>
</tr>
<tr>
<td>Comparison</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

As with the prior analysis, negative $d$ scores indicate a decrease in PDA when pretest and posttest scores were compared. Results indicate that participants had a greater percent days abstinent following treatment with CBT ($d = -0.803$, SEM = 0.103, $p < 0.0001$).

**Table 5**

**TLFB Comparison TSF to CBT**

<table>
<thead>
<tr>
<th>Study</th>
<th>TSF $n$</th>
<th>Mean</th>
<th>SD</th>
<th>CBT $n$</th>
<th>Mean</th>
<th>SD</th>
<th>$d$</th>
<th>SEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brown et al. (2006)</td>
<td>29</td>
<td>72</td>
<td>48</td>
<td>37</td>
<td>84</td>
<td>26.8</td>
<td>-0.319</td>
<td>0.250</td>
</tr>
<tr>
<td>Grant vs. Haller et al.</td>
<td>63</td>
<td>92.4</td>
<td>21.2</td>
<td>62</td>
<td>82</td>
<td>24</td>
<td>0.460</td>
<td>0.181</td>
</tr>
<tr>
<td>Lydecker et al.</td>
<td>99</td>
<td>70</td>
<td>25</td>
<td>107</td>
<td>87</td>
<td>2</td>
<td>-0.978</td>
<td>0.148</td>
</tr>
<tr>
<td>Comparison</td>
<td>-</td>
<td>-</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-0.390</td>
<td>0.104</td>
</tr>
</tbody>
</table>

For this analysis, post treatment results for Grant et. al. (2018) were compared to post treatment results for Haller et. al (2016) because Grant et. al (2018) included a TSF treatment only and Haller et. al (2016) included a CBT treatment only. The studies had similar numbers of
participants and demographic information. Results indicate that participants had a greater percent days abstinent following treatment with CBT than with TSF ($d = -0.390$, SEM. = 0.104, $p < 0.0001$).

**The Addiction Severity Index (ASI)**

The Addiction Severity Index (ASI) was used to gather information on family and social problem severity. The composite scores represent overall problem severity during the prior 30 days (range 0-1.00, with higher scores indicating greater problem severity). The ASI has demonstrated good internal consistency, test-retest and inter-rater reliabilities in different groups of substance abusers (McLellan et al., 1980; McLellan et al., 1985).

**Table 6**

*ASI TSF Studies Outcomes - Alcohol Use*

<table>
<thead>
<tr>
<th>Study</th>
<th>Pretest</th>
<th>Posttest</th>
<th>Pretest</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$n$</td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
</tr>
<tr>
<td>Grant et al. (2018)</td>
<td>195</td>
<td>.40</td>
<td>.26</td>
<td>0.17</td>
</tr>
</tbody>
</table>

**Table 7**

*ASI TSF Studies Outcomes - Drug Use*

<table>
<thead>
<tr>
<th>Study</th>
<th>Pretest</th>
<th>Posttest</th>
<th>Pretest</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$n$</td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
</tr>
<tr>
<td>Grant et al. (2018)</td>
<td>195</td>
<td>.08</td>
<td>.11</td>
<td>.03</td>
</tr>
</tbody>
</table>

Comparison between family and social problems related to alcohol and drug use following treatment using TSF indicated that the change in scores pre and posttest were significantly improved for both alcohol and drugs. However, when compared to each other, results indicated a more significant improvement in family and social problems related to alcohol use than those
related to drug use \((d = .798, \text{ SEM } = 0.075, p < 0.001)\). It should be noted that the scores for drug use were significantly lower at the time of pretest compared to the alcohol scores.

Table 8

\textit{CBT Studies Outcomes - Alcohol Use}

<table>
<thead>
<tr>
<th>Study</th>
<th>Pretest</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(n)</td>
<td>Mean</td>
</tr>
<tr>
<td>Desai et al. (2008)</td>
<td>91</td>
<td>.22</td>
</tr>
</tbody>
</table>

Table 9

\textit{CBT Studies Outcomes - Drug Use}

<table>
<thead>
<tr>
<th>Study</th>
<th>Pretest</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(n)</td>
<td>Mean</td>
</tr>
<tr>
<td>Desai et al. (2008)</td>
<td>91</td>
<td>0.11</td>
</tr>
</tbody>
</table>

Comparison between family and social problems related to alcohol and drug use following treatment using CBT indicated that the change in scores pre and post-test were significantly improved for both alcohol and drugs. However, when compared to each other, results indicated a more significant improvement in scores related to family and social problems related to drug use than those related to alcohol use \((d = 1.20, \text{ SEM.} = 0.117, p < 0.001)\).

Table 10

\textit{ASI Comparison TSF to CBT Alcohol Use}

<table>
<thead>
<tr>
<th>Study</th>
<th>TSF</th>
<th>CBT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(n)</td>
<td>Mean</td>
</tr>
<tr>
<td>Comparison</td>
<td>195</td>
<td>0.17</td>
</tr>
</tbody>
</table>

Results indicate that participants experienced greater improvement in family and social problems associated with alcohol with TSF than with CBT \((d = -0.268, \text{ SEM } = 0.127, p < 0.001)\).
Table 11

<table>
<thead>
<tr>
<th>Study</th>
<th>TSF n</th>
<th>Mean</th>
<th>SD</th>
<th>CBT n</th>
<th>Mean</th>
<th>SD</th>
<th>d</th>
<th>SEM</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comparison</td>
<td>195</td>
<td>0.03</td>
<td>.05</td>
<td>91</td>
<td>0.09</td>
<td>.01</td>
<td>-1.44</td>
<td>0.140</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Results indicate that participants experienced greater improvement in family and social problems associated with drug use following TSF than CBT ($d = -0.390$, SEM = 0.104, $p < 0.001$).

**Meta-Analysis Results**

The TimeLine Follow Back (TLFB) data, when comparing Brown et al. (2006), Grant et al. (2018) and Lydecker et al. (2010), indicated that participants had an increase of percent days abstinent (PDA) following treatment with TSF ($d = -0.945$, SEM = 0.109, $p < 0.0001$). The TLFB CBT data found, when comparing Brown et al. (2006), Haller et al. (2016) and Lydecker et al. (2010), it also indicated that participants had an increase in percent days abstinent (PDA) following treatment with CBT ($d = -0.803$, SEM = 0.103, $p < 0.0001$). This led to a TLFB comparison of TSF to CBT involving Brown et al. (2006), Haller et al. (2016), Grant et al. (2018) and Lydecker et al. (2010). For this analysis, post treatment results for Grant et. Al, (2018) were compared to post treatment results for Haller et. al. (2016) because Grant et. al. (2018) included a TSF treatment only and Haller et. al. (2016) included a CBT treatment only. The studies had similar numbers of participants and demographic information. Results indicated that participants had a greater PDA following treatment with CBT than with TSF ($d = -0.390$, SEM = 0.104, $p < 0.0001$). This is notable as it reinforces existing studies’ results (Brown et al., 2006; Granholm et al., 2011; Lydecker et al., 2010).

The Addiction Severity Index (ASI) TSF Alcohol Use and Drug Use data acquired from the Grant et al. (2018) study allowed for comparison between family and social problems related to alcohol and drug use following treatment using TSF and indicated that the change in scores
pre and post-test were significantly improved for both alcohol and drug ASI measures. However, when compared to each other, results indicated a more significant improvement in family and social problems related to alcohol use than those related to drug use (d = 0.798, SEM = 0.075, p < 0.001). It should be noted that the scores for drug use were significantly lower at the time of pretest compared to the alcohol scores.

The Addiction Severity Index (ASI) CBT Alcohol Use and Drug Use data acquired from the Desai et al. (2008) study allowed for comparison between family and social problems related to alcohol and drug use following treatment using TSF indicated that the change in scores pre and post-test were significantly improved for both alcohol and drugs. However, when compared to each other, results indicated a more significant improvement in scores related to family and social problems related to drug use than those related to alcohol use (d = 1.20, SEM = 0.117, p < 0.001). During CBT treatment, participants didn’t report a significant difference in changes to family and social problem severity related to alcohol use.

This led to an ASI comparison of TSF to CBT Alcohol Use using the combined data from Grant et al. (2018) and Desai et al. (2008). These results indicate that participants experienced greater improvement in family and social problems associated with alcohol with TSF than with CBT (d = -0.268, SEM = 0.127, p < 0.001). This same ASI comparison was then done using TSF to CBT Drug Use data. These results indicate that participants experienced greater improvement in family and social problems associated with drug use following TSF than CBT (d = -0.390, SEM = 0.104, p < 0.001). The results of the meta-analysis are presented in Table 12.

Table 12

<table>
<thead>
<tr>
<th>Outcome of Comparisons of TSF to CBT</th>
<th>Cohen’s d</th>
<th>Lower Limit</th>
<th>Upper Limit</th>
<th>p</th>
<th>I²</th>
</tr>
</thead>
</table>

Meta-Analysis Results
<table>
<thead>
<tr>
<th></th>
<th>PDA</th>
<th>ASI – Alcohol</th>
<th>ASI - Drug</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-0.326</td>
<td>-0.531</td>
<td>-0.121</td>
<td>0.002</td>
</tr>
<tr>
<td></td>
<td>0.002</td>
<td>0.035</td>
<td>&lt;0.001</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>-0.144</td>
<td>-1.71</td>
<td>-1.16</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>-0.585</td>
<td>-0.723</td>
<td>-0.448</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

**Publication Bias and Internal Validity**

Systematic review and meta-analysis interpretations should be considered while accounting for publication bias and internal validity. Publication bias is a source of type I error and refers to studies with statistically significant findings having a better chance of publication and an increased chance of being published in prestigious journals (Greco et al., 2013). Internal validity was maintained by strictly following PRISMA-P. The study presented focused research questions that were clinically relevant and derived from peer reviewed journals. The literature search was comprehensive, and references of included articles were hand-searched to warrant article saturation. Characteristics of the study were thoroughly examined with regard to inclusion and exclusion criteria (Greco et al., 2013).

**Summary**

The results of the systematic review indicated that CBT and TSF group interventions have been most commonly utilized for veterans with SUD. Group sessions were typically one-hour in length and studies tended to assess impact on substance use and abstinence in a longitudinal manner. Group participants varied in their use of substances. The results of the meta-analysis indicated, that CBT groups produce the greatest effect on substance use over time and TSF groups produce the greatest effect on familial and social issues for veterans with SUD. The results will be discussed in chapter five.
CHAPTER 5
Findings, Conclusions, and Discussions

Introduction

Chapter one introduced the proposed study and outlined the purpose for studying group approaches to treating veterans with substance use disorders (SUDs). This was followed by a description and background of the problems associated with this population. Next, the purpose and significance of the study was reviewed, and the research design and limitations were described. Chapter one concluded with a definition of terms.

Chapter two started with a review of the literature and broadly addressed substance abuse in society today. The chapter then narrowed to address veterans and their relationship with substance abuse. This was followed by the consequences and treatments unique to the veteran population. An inclusive description of group therapies currently used by veterans with SUD was then provided and the chapter ended with the rationale for the current study.

Chapter three included a detailed description of meta-analysis and its use in the current study. A description of PRISMA-P 2015, the protocol used to guide the study, was provided. Eligibility criteria, information sources and search strategies were specified, and consideration was given to internal and external threats to validity.

Chapter four opened with a brief summary and review of the study’s research questions. This was followed by evidence of strict adherence to the PRISMA-P and review of each study included in the analyses. Findings from the systematic review and meta-analysis are delineated.

This chapter will provide a review of the previous chapters followed by an overview of the study’s procedures and major findings. Next, there will be a discussion of the findings followed by conclusions guided by the study’s research questions. This chapter ends with an
overview of the study, and a look at the generalizability of the study’s findings, followed by limitations, implications, and suggestions for future research.

**Overview of Procedures**

A preliminary search of seven databases, including Google Scholar, Medline, Psych Articles, Psych Info, Pub Med, Science Citation, and Science Direct was conducted. Key terms were then identified from the database search and refined using Boolean operators (e.g., AND, OR, NOT, and AND NOT) to extend or narrow the number of manuscripts for consideration. Only studies that included the use of psychoeducational, CBT, or support group/interventions were considered. The studies found included manuscripts published in English after the year 2000. All located primary sources included the sample size, mean, and standard deviation for each outcome variable (Borenstein, Hedges, Higgins, & Rothstein, 2009). Only quantitative research designs that reported enough data to calculate effect sizes were included.

Manuscripts were then excluded from the systematic review and meta-analysis if they were published before 2000, were not in English, or had insufficient data to calculate an effect size. This resulted in the dismissal of all qualitative, conceptual, and descriptive works. Studies that only used participant satisfaction as an outcome variable were excluded as well as any studies where the psychoeducational, CBT, and support group outcomes were incomplete or not included.

A mixed methods research design was used. The qualitative portion applied to the systematic review of the literature and the quantitative portion was the meta-analysis. The inclusion, search, and coding procedures to conduct the analyses were implemented using the preferred reporting items for systematic review and meta-analysis protocols (PRISMA – P) (Shamseer et al., 2015).
Once the articles were determined, data was coded and extracted from the Methods and Results sections to conduct the qualitative systematic review of the literature. Salient themes were then identified. A quantitative meta-analysis was also conducted using the statistical software Comprehensive Meta-Analysis-3. The data was processed in the software to calculate Cohen’s $d$, or Hedges’ $g$ (Borenstein et al., 2009).

The purpose of this meta-analysis and systematic review was to review and assess the use of CBT and support group therapy in the treatment of veterans who have SUDs. Because most studies include heterogenous groups for veterans addressing issues pertaining to various substances as opposed to homogenous groups of veterans with addictions specific to a particular substance, such as alcohol or marijuana, this study included research addressing veterans with any type of SUD, as defined by the Diagnostic and Statistical Manual-5 (American Psychiatric Association, 2013).

No meta-analyses exist pertaining to group therapy in the treatment of veterans with SUDs. The aim of this study was to address the following research questions:

1. What are viable treatment outcomes for psychoeducational, CBT, and support groups of veterans with SUDs?
2. What are the measures that capture outcomes related to psychoeducational, CBT, and support groups of veterans with SUDs

**Major Findings**

The following provides an overview of the major findings. First, themes that emerged from the systematic review will be discussed followed by a synopsis of each theme. Then results of the meta-analysis will be described.
Systematic Review

Three themes emerged from the systematic review: group type, length of intervention/involvement in group, and substances targeted for reduction/abstinence. Group type consists of the three group treatments that were identified through the review of the literature: 1) TSF groups, 2) cognitive behavioral therapy, and 3) psychoeducational groups. Length of intervention or involvement in group refers to the length of intervention strategies employed in the studies. They varied by 1) the amount of time participants were expected to spend engaged in the groups and 2) the total length of the research studies including all data collection points. Substances targeted for reduction or abstinence emerged as the final theme and refers to how different studies targeted participants’ use of various substances.

Group type

There were a total of 20 groups (9 TSF groups, 10 CBT groups and 1 psychoeducational group) that were studied in the 14 articles included in the systematic review. Three of the 14 articles used a comparison group. One study used a non-veteran comparison group, another study included a non-alcoholic comparison group, and one compared participants with PTSD and SUDs to a group of participants with PTSD only. For these three studies, only the groups measuring veterans’ change in substance use were used for comparisons. Five of the studies included both a CBT and TSF group. For these five studies, results from the groups were disaggregated for comparison across manuscripts.

It appears that there is a preference for CBT and TSF groups in treating veterans with SUD. This may be due to the increased focus in recent years on utilizing TSF as a legitimate form of treatment for those with SUD. Additionally, CBT has been a common form of treatment for those with SUDs. Because psychoeducation is so commonly used for various forms of
training and treatment in the military, it was surprising to find so few research articles on its use with veterans with SUD.

**Length of intervention or involvement in group meetings**

All TSF groups surveyed lasted approximately 1 hour. Four studies followed a format where participants attended 1-hour meetings twice weekly for a twelve-week period and then once a week for an additional twelve weeks (Brown et. al, 2006; Granholm et al., 2011, Lydecker et. al, 2010; Worley et. al, 2012; Worley et. al, 2013). Bonn-Miller et. al (2011) tracked the number of meetings participants attended by surveying them over the course of five years. Results from Galanter et. al. (2014) were from a single administration of a survey to participants who were currently attending TSF group meetings. Grant et al. (2018) conducted a pretest-posttest design that followed veterans’ substance use over a six-month period. McKay et. al (2001) followed a group of veterans over a 24-month period with check-ins at every six months. Results from these studies indicated that there was a correlation between frequency of attendance at TSF groups and reduction in frequency of drinking for the participating veterans. This aligns with previous studies of TSF groups in general which have found that higher dosages of groups result in improved responses with regard to substance use (Gossop, Stewart & Marsden, 2008; Fiorentine & Fiorentine, 2001).

As with TSF, all CBT sessions lasted for approximately an hour. Groups were classified under this heading if they followed the basic tenets of CBT. Therefore, the terms cognitive processing therapy \((n = 1)\), and integrated cognitive behavior therapy \((n = 2)\) were included in this category. Seven studies followed a format where participants attended sessions twice a week for the first 12 weeks and then once a week for the next 12 weeks with data being collected every 3 months for 6 months of treatment and 12 additional months of follow-up (Brown et. al., 2006; Dasai et. al, 2008; Granholm et. al, 2008; Haller et. al, 2016; Lydecker et. al, 2010; Worley et.
al., 2012, Worley et. al, 2013). Cook et. al (2006) treated veterans for 25 sessions over 14 months collecting pretest and posttest data. Kaysen et. al (2014) compared data from veterans with and without SUDs who participated in 12 sessions over 12 weeks. McGuire et. al, (2018) conducted a pretest-posttest design with veterans participating in an intensive program comprised of 42 sessions over a 6-week period. As with TSF, veterans who attended more CBT groups experienced greater levels of abstinence. This dose-response outcome has also been found generally for CBT groups and substance use (Baker, Kavanagh, Kay, Hunt, Lewin, Carr, & Connolly, 2010; Covi, Hess, Schroeder, & Preston, 2002).

Most groups, including CBT and TSF typically last one hour. Many of the studies (9) were longitudinal and gathered data at several points post treatment. This is important for assessing treatment impact on substance use beyond the immediate effects of the intervention.

**Substances targeted for reduction or abstinence**

The outcome measures used to measure substance use reduction or abstinence in the studies included in the systematic review were formal assessments, self-reports, and toxicology. The systematic review included 14 studies, 12 of which tracked reduction in use or abstinence from a variety of substances. The two articles that did not address reduction or abstinence, but instead addressed impact of substance use on PTSD (McGuire et. al, 2018) and TSF meeting attendance between veterans and non-veterans (Galanter et. al., 2014), did not contribute to this theme. For the 12 that did produce codes toward the theme, most commonly (n = 10), participants reported use of alcohol and additional substances. Kaysen et. al (2014) reported data on participants’ use of alcohol only and McKay et. al (2001) reported outcomes for participants’ use of cocaine only.

It appears that the reason multiple substances were addressed in most of the studies is because a history of substance use was ascertained from participants in each of the studies.
Consequently, even if a participant wasn’t actively using a multitude of substances at the time of the study, tracking use patterns, particularly with regard to abstinence, included use of any substance ever used. Additionally, since most of the studies were conducted in VA hospital settings or facilities serving those with addiction to various substances, and patients are typically treated together, despite the type of substance to which they are addicted, it is not surprising that the studies included these heterogenous groups in their studies.

**Meta-Analysis Findings**

The meta-analysis included 5 studies (Brown et al., 2006; Desai et al., 2008; Grant et al., 2018; Haller et al., 2016; & Lydecker et al., 2010). The majority of studies that did not qualify for the meta-analysis were for two reasons: (1) insufficient data was provided to calculate Cohen’s $d$, and (2) results were not provided specific to the treatment group. Desai et al. (2008) contained the only psychoeducational group study that met the required criteria for the systematic review but not for the meta-analysis. It could not be included in the meta-analysis because the data was not replicable to the data in the other studies and its combined effect could not be assessed. A CBT group was also included in the Desai et al. (2008) article, and this group did produce usable data for the meta-analysis. Consequently, the meta-analysis focused on TSF and CBT groups exclusively. Of the qualifying studies, 2 only addressed CBT groups, 1 only addressed support groups, and 2 addressed a combination of CBT and support groups. Consequently, data addressing results from 4 CBT groups and 3 support groups was included in the meta-analysis.

A variety of outcome measures were used in the studies and two emerged that had sufficient data for comparison across studies. The two measures were the Timeline Follow-Back (TLFB) measure, which documents the frequency of alcohol and drug use and quantity of alcohol and drug use in the past 30-, 60-, or 90-day segments (Sobell & Sobell, 1992), and the
Addiction Severity Index (ASI), which is used to gather information on family and social problem severity during the prior 30 days (McLellan et al., 1980; McLellan et al., 1985).

Pertaining to percent of days abstinent (PDA) as measured by the TLFB by Brown et al. (2006), Grant et al. (2018) and Lydecker et al. (2010), participants increased PDA following treatment with TSF (d = -0.945, SEM = 0.109, p < 0.0001). Likewise, PDA measured with the TLFB by Brown et al. (2006), Haller et al. (2016) and Lydecker et al. (2010) also resulted in a significant increase in PDA following treatment with CBT (d = -0.803, SEM = 0.103, p < 0.0001). When comparing PDA between TSF treatment and CBT treatment (Brown et al., 2006; Haller et al., 2016; Grant et al., 2018; & Lydecker et al., 2010), results indicated that participants had a greater PDA following treatment with CBT than with TSF (d = -0.390, SEM = 0.104, p < 0.0001). This is notable as it reinforces existing studies’ results (Brown et al., 2006; Granholm et al., 2011; Lydecker et al., 2010).

Pertaining to changes in family and social problems related to improvements in alcohol and drug use as measured by the Addiction Severity Index (ASI), data was acquired from the Grant et al. (2018) study for TSF treatment and the Desai et al. (2008) study for CBT treatment. For TSF treatment, changes in scores pre and post-test were significantly improved for both alcohol and drug use. However, when compared to each other, results indicated a more significant improvement in family and social problems related to alcohol use than those related to drug use (d = .798, SEM = 0.075, p < 0.001). For CBT treatment, results also indicated significant improvement in scores related to family and social problems for both alcohol and drugs. However, when compared to each other, results indicated a more significant improvement in scores related to drug use than alcohol use (d = 1.20, SEM = 0.117, p < 0.001). Additionally, when comparing changes in family and social problems between TSF treatment and CBT treatment, results indicated that participants had more significant improvements in family and
social problems following treatment with TSF than with CBT related to both alcohol and drug use ($d = -0.268$, $SEM = 0.127$, $p < 0.001$; $d = -0.390$, $SEM = 0.104$, $p < 0.001$ respectively).

In summary, CBT was shown to be more effective than TSF in increasing the percentage days abstinent for veterans with SUD. Additionally, TSF was shown to be more effective than CBT in reducing family and social problems associated with early recovery for veterans with SUD.

Conclusions

The following conclusions are derived from the results of the analyses with regard to each research question. A discussion of how the findings relate to or differ from the current pool of literature that was discussed in chapter two is embedded throughout.

Research Question

1. **What are viable treatment outcomes for psychoeducational, CBT and support groups of veterans with SUDs?**

This systematic review and meta-analysis reviewed existing published material surrounding veterans, substance use disorder, and group treatment. The narrowing of available data coupled with thematic analysis and a comparison of transferable measures resulted in the following answers to the proposed research question: 1) While psychoeducation groups are widely accepted as a successful intervention to be used on veterans with SUD (Bonar, Walton, Cunningham, Chermack, Ilgen, Blow & Booth, 2017; Mulligan, Fear, Jones, Alvarez, Hull, Naumann & Greenberg, 2012), this meta-analysis revealed that there is a dearth of available data on the efficacy of psychoeducation groups used in the veteran population. 2) TSF, 12-Step Recovery and Support Groups have shown a significant level of success and popularity in the non-veteran world (Worley, Tate, McQuaid, Granholm, & Brown (2013), yet the results from the present meta-analysis indicate that they are less effective than
CBT groups when used on veterans with SUD pertaining to abstinence and reduction of use. 3) TSF groups have been found to reduce veterans’ family problems and social issues (Galanter, Dermatis & Sampson, 2014), and the meta-analysis supported this finding. In fact, the results of the meta-analysis indicate that TSF is more effective than CBT in reducing family and social problems related to both drug and alcohol use among veterans.

2. **What are the measures that capture outcomes related to psychoeducational, CBT, and support groups of veterans with SUDs?**

This study has shown that the CBT group therapy modality produces the highest levels of efficacy in promoting abstinence among veteran populations with substance use disorders. It also has shown that TSF produces the highest levels of efficacy in improving family and social problems among veteran populations with substance use disorders. This analysis aimed to extend our understanding of the effectiveness of a particular group approach to treating SUDs in veterans as a potential stand-alone treatment possibility or as an integral part of an integrated treatment program. This meta-analysis has shown that veterans respond well to CBT and TSF group counseling and if compared to each other, CBT is associated with greater lengths of abstinence while TSF is associated with improved family and social issues.

**Discussion**

This study’s systematic review has led to the emergence of the following themes: 1) Three group treatments were identified through the review of the literature: a) 12-step groups, b) cognitive behavioral therapy, and c) psychoeducational groups. 2) The length of intervention strategies differed in the amount of time participants were expected to spend engaged in the group experience. 3) The studies targeted participants’ use of various substances. The corresponding meta-analysis has allowed us to view CBT group treatment of veterans with SUD as an effective method to increase veterans’ percentage of days abstinent (PDA). This study
has also shown that veterans experience a decrease in family and social problems most effectively when involved with TSF.

The themes from the systematic review and the efficacy established in the meta-analysis were noted when studies examined CBT and TSF separately (Bonar, Walton, Cunningham, Chermack, Ilgen, Blow & Booth, 2017; Brown, Glasner-Edwards, Tate, McQuaid, Chalekian & Granholm, 2006), as well as when they are used in combination (Bonn-Miller, Zvolensky & Moos, 2011; Worley, Tate, McQuaid, Granholm & Brown, 2013). The results of the present study support existing research indicating that CBT group therapy has been successful in producing more days abstinent from drugs and alcohol than other group treatment modalities (Brown et al, 2006; Granholm et al, 2011; Shamseer et al, 2015; Acosta et al, 2017). This study also reinforces existing studies indicating that TSF group treatment is an effective vehicle for reducing family and social problems (Gossop, Stewart, & Marsden, 2008; Donovan, Ingalsbe, Benbow, & Daley, 2013; Lipari, & Van Horn, 2017).

Today’s treatment of veterans with SUD has relied heavily on group interventions. Group treatment is both cost effective and evidence based which in turn allows for the reimbursement of costs through insurance (TriCare) (U.S. Department of Veterans Affairs, 2019a; SAMSA, 2005). The results of this study can be used to guide our decisions when referring veterans to treatment. Applying the findings from this meta-analysis, it would be advantageous to incorporate both CBT and TSF into the group treatment. This combination has been shown to have positive results on both veterans and non-veterans (Brown et al, 2006; Granholm et al, 2011; Shamseer et al, 2015; Acosta et al, 2017). Based on the results of the systematic review, it would also be advantageous to promote higher dosages of groups, as the more frequently veterans participated in CBT and TSF groups, the higher their rates of abstinence. This has also been substantiated with non-veteran populations (Baker, Kavanagh, Kay, Hunt, Lewin, Carr, &
Connolly, 2010; Covi, Hess, Schroeder, & Preston, 2002; Fiorentine & Fiorentine, 2001; Gossop, Stewart & Marsden, 2008).

Treatment approaches to addiction are often delivered to veterans in the following forms: inpatient residential treatment, intensive outpatient programs, and weekly check-in programs (Funderburk, et al. 2011; Galanter, Kleber, & Brady, 2014). The group treatment types outlined in this study as most beneficial to veterans with SUD are found primarily in inpatient residential treatment and intensive outpatient programs. It is important to note that the decision to choose either inpatient or outpatient services should be based on the severity of veterans SUD and that either modality can provide CBT and TSF group treatment.

The veteran population currently maintains a higher rate of SUD than the civilian population (Holleran, Steiker, McCarthy & Downing, 2012; NIDA, 2017). This may be fueled in part by service-related issues like post-traumatic stress disorder (PTSD) and traumatic brain injuries (TBI). Veterans often self-medicate through the use of alcohol and/or pain medication. This self-medicating can last for years and can develop into a SUD that further isolates the veteran and can make proper diagnosis of the underlying conditions difficult (Petrakis, Rosenheck & Desai, 2011; Tsai & Rosenheck, 2015). When SUDs co-occur with PTSD and/or TBI, the treatment usually has poorer outcomes than does treatment for either disorder in isolation (Hildebrand, Behrendt, & Hoyer, 2015; Capone et al, 2018). Considering veterans face the same consequences experienced by the general population as well additional consequences related to their status as a veteran, it is important for SUD treatment to be tailored to this population (Capone et al, 2018).

The consequences that often accompany SUD tend to be exacerbated by this population’s veteran status. Like the general population, they may experience elevated rates of unintentional injuries, domestic violence, automobile accidents, and hospitalizations, but unlike the general
population, veterans tend to be less inclined to ask for help and are assumed by the general population that they can handle more stress (Teeters, Lancaster, Brown & Back, 2017). This results in SUDs becoming more severe for veterans before they eventually seek help (Funderburk, Sugarman, Labbe, Rodrigues, Maisto & Nelson, 2011). Utilizing CBT to promote abstinence and TSF to improve family and social conditions for veterans may be a viable approach to address many of the service related issues that result in substance abuse and subsequent consequences.

Widespread addiction to legal and illegal substances continues to be a serious issue in the United States. The Substance Abuse and Mental Health Services Administration (SAMHSA) reported that over 19.7 million people were estimated to have a diagnosable SUD in 2017 (SAMHSA, 2017). A targeted intervention of appropriate treatment for veterans with SUD can work to reduce this growing statistic. This widespread phenomenon continues to severely tax the U.S. economy with an estimated $740 billion-dollars lost in healthcare expenses, workplace productivity, and crime-related costs. It is incumbent upon us to appropriately treat this valued population and not add to this ever-increasing trend (NIDA, 2017).

Generalizability

External validity addresses a study’s transferability and generalizability to other contexts (Creswell, 2014). This meta-analysis and systematic review included a total of 4308 participants including 608 participants who were non-veterans. External validity was strengthened by pooling sample size data and thus, increasing statistical power (Creswell, 2014). Additionally, inclusion of studies spanning 20 years of published articles also aimed to reduce threats to external validity (Chalmers, 1989). External validity was also maintained through the exclusion of unpublished studies. Since the study participants included a large pool of males ($n = 3748; 87\%$) and a
smaller pool of females \( n = 560; 13\% \), the data is more generalizable to male veterans with SUD.

**Limitations**

There is a relatively limited amount of current research on the efficacy of group treatment for veterans with SUDs, particularly regarding psychoeducational groups, skills development groups, and interpersonal process groups. Due to this dearth in available research, skills development groups and interpersonal process groups were not included in the present systematic review or meta-analysis, and psychoeducational groups were not included in the present meta-analysis. Many of the articles included in the present study focused on comorbid issues often associated with SUD in veterans such as PTSD, TBI, anxiety, or depression, for example. Due to this focus on dual issues, group impact specific to SUD may not be as clear in the results.

Additionally, due to the predominantly male population of the military and larger addiction rates associated with male veterans, there was a disproportionately small female sample (female, \( n = 560 \)) when compared to the larger male sample (male, \( n = 3748 \)). This limitation may impact our ability to identify differences in efficacy based on gender. Another noted limitation was that many of the studies relied almost entirely on patient self-reports. In the field of SUDs this may raise questions regarding their reliability and validity as mentioned in Richer & Johnson’s 2001 study. Lastly, due to variations in the studies of group treatment for veterans with SUD, of the 14 studies that satisfied all 7 criteria, only 5 had sufficient homogeneity to combine effect sizes credibly. Moreover, disaggregating studies by group type and additional variables resulted in too few studies available for inclusion in subgroup analyses.
Implications of Current Study

This meta-analysis adds to the existing body of evidence-based treatment and provided information about the viability of CBT and TSF group therapy for the treatment of veterans with SUDs. While studies existed indicating efficacy in the use of these group formats in the treatment of veterans with SUD, no meta-analysis had been conducted to this researcher’s knowledge, to assess key aspects of these group approaches in treatment. Among these group approaches to treatment, there was a clear need to distill the existing data down to a set of “best practices” for the group treatment of veterans with substance use issues. This knowledge contributes to evidence-based treatment and provides information about the viability of lower cost treatments such as CBT group therapy, and the even lower cost of TSF group treatment. This study also provides a framework for information dissemination and increases our knowledge about the efficacy and efficiency of using these groups in the treatment of veterans with SUD.

Clinical Implications for Group Programs and Providers

Substance use disorder group treatment providers need to be made aware of the unique needs of the veteran population. The lack of existing research on group treatment for veterans with SUD makes enhancing awareness among treatment professionals difficult. The results of this meta-analysis may serve to assist treatment providers in the selection of appropriate interventions that may be best suited to veterans with SUD, particularly when seeking treatment aimed at promoting abstinence and family/social wellbeing. This awareness of efficacy attached to both CBT group and TSF groups can enhance a provider's services without incurring an additional cost. Due to national (and international) access to TSF at zero cost to the veteran and the veteran's insurance company (TriCare), this group treatment can be
added to an existing CBT treatment program, thus resulting in a more specialized and comprehensive treatment plan.

The veteran experiences both internal and external wreckage as a result of their SUD. The internal wreckage experienced stems from issues surrounding self-worth, shame, anxiety, depression, and falling short of one’s self-expectation. The external wreckage experienced refers to the damage inflicted on the veteran’s relationships with others. So very often, the greatest toll is inflicted on family, social, and work relationships. It is important to note that much of the work done while participating in a CBT group is internal in nature and may not be readily seen by family, friends, and co-workers. While entry into a TSF group is a cultural immersion experience with far more points of contact with the veteran that can be observed by their external relationships (daily meetings, daily sponsor contact, recovery related social events, service work, and hours of step-work with their sponsor). This awareness of efficacy attached to both CBT group and TSF groups and its alignment with the internal and external issues associated with veterans with SUD allows the clinician a more target approach to treatment of veterans with SUD.

**Implications for Counselor Education and Supervision**

It is notable that the current study found the use of CBT groups to be particularly efficacious in the treatment of veterans with SUD. Specifically, this study found that CBT groups were particularly effective in increasing the percentage of days abstinent from both drugs and alcohol among veteran participants. Counselor educators may use the results of this study to raise awareness among emerging counselors of the high rate of SUD in the veteran population, the unique needs of the veteran population with SUD, and recommended data-driven treatment approaches, including CBT and TSF (SAMHSA, 2017) as well as providing instruction and experiences with these approaches.
Additionally, this study may bring a noted awareness to the lack of substantive instruction around TSF groups and their inclusive culture. Preparing counselors to better understand what TSF is and how beneficial it can be to veteran patients may enhance their integration of this approach into their treatment plan. For example, a thorough understanding of the complexity of TSF could be translated to veteran patients so they are better able to dispel the well-known negative stereotypes associated with this type of treatment. These stereotypes may include but are not limited to the belief that the veteran must believe in God to participate, the belief that their reputation will be ruined if they see someone they know at a meeting and that meetings are just groups of alcoholics talking about drinking. A more robust understanding of the 12-Step Recovery culture needs to be passed down to the next generation of counselors and supervisors so that veteran patients can benefit from the social and familial impact of TSF participation.

**Recommendations for Future Research**

There is a clear and present need for further research on the efficacy of group treatment for veterans with SUDs, particularly with regard to psychoeducational groups, skills development groups, and interpersonal process groups. In particular, psychoeducational group treatment is heavily utilized in the Veteran Affairs system (SAMHSA, 1997). Research is needed to validate/invalidate the use of these groups on veterans with SUDs. Continued research in this direction could ascertain if the psychoeducational format is indeed helping these veterans.

Future research focused specifically on veterans with SUD and not additional comorbid issues is also needed. Most of the studies in the current research explored the impact of group interventions on veterans with SUD and other issues such as PTSD, TBI, anxiety and depression. Due to this current trend to assess the impact of treatment on dual issues, the group
impact specific to veterans with SUD may not be as easily disaggregated and thus true effect may be missed.

Additionally, due to the predominantly male population of the military and larger addiction rates associated with male veterans, there was a disproportionately small female sample (female, n=560) when compared to the larger male sample (male, n=3748). This limitation may impact our ability to identify differences in efficacy based on gender and make the results more difficult to generalize to female veterans with SUD. Future research focused on female veterans with SUD is needed to enhance practitioners’ understanding of their specific needs.
References


doi:10.1080/08897077.2012.691451


doi:10.1037/prj0000360

## Appendix A- PRISMA-P 2015 Checklist

<table>
<thead>
<tr>
<th>Section/topic</th>
<th>Item</th>
<th>Checklist item</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ADMINISTRATIVE INFORMATION</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Title</strong></td>
<td>1a</td>
<td>Identify the report as a protocol of a systematic review</td>
</tr>
<tr>
<td><strong>Update</strong></td>
<td>1b</td>
<td>If the protocol is for an update of a previous systematic review, identify as such</td>
</tr>
<tr>
<td><strong>Registration</strong></td>
<td>2</td>
<td>If registered, provide the name of the registry (e.g., PROSPERO) and registration number</td>
</tr>
<tr>
<td><strong>Authors</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Contact</strong></td>
<td>3a</td>
<td>Provide name, institutional affiliation, and e-mail address of all protocol authors; provide physical mailing address of corresponding author</td>
</tr>
<tr>
<td><strong>Contributions</strong></td>
<td>3b</td>
<td>Describe contributions of protocol authors and identify the guarantor of the review</td>
</tr>
<tr>
<td><strong>Amendments</strong></td>
<td>4</td>
<td>If the protocol represents an amendment of a previously completed or published protocol, identify as such and list changes; otherwise, state plan for documenting important protocol amendments</td>
</tr>
<tr>
<td><strong>Support</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sources</strong></td>
<td>5a</td>
<td>Indicate sources of financial or other support for the review</td>
</tr>
<tr>
<td><strong>Sponsor</strong></td>
<td>5b</td>
<td>Provide name for the review funder and/or sponsor</td>
</tr>
<tr>
<td><strong>Role of sponsor/funder</strong></td>
<td>5c</td>
<td>Describe roles of funder(s), sponsor(s), and/or institution(s), if any, in developing the protocol</td>
</tr>
<tr>
<td><strong>INTRODUCTION</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Rationale</strong></td>
<td>6</td>
<td>Describe the rationale for the review in the context of what is already known</td>
</tr>
<tr>
<td><strong>Objectives</strong></td>
<td>7</td>
<td>Provide an explicit statement of the question(s) the review will address with reference to participants, interventions, comparators, and outcomes (PICO)</td>
</tr>
<tr>
<td><strong>METHODS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Eligibility criteria</strong></td>
<td>8</td>
<td>Specify the study characteristics (e.g., PICO, study design, setting, time frame) and report characteristics (e.g., years considered, language, publication status) to be used as criteria for eligibility for the review</td>
</tr>
<tr>
<td><strong>Information sources</strong></td>
<td>9</td>
<td>Describe all intended information sources (e.g., electronic databases, contact with study authors, trial registers, or other grey literature sources) with planned dates of coverage</td>
</tr>
<tr>
<td><strong>Search strategy</strong></td>
<td>10</td>
<td>Present draft of search strategy to be used for at least one electronic database, including planned limits, such that it could be repeated</td>
</tr>
<tr>
<td><strong>Study records</strong></td>
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<td></td>
</tr>
<tr>
<td><strong>Data management</strong></td>
<td>11a</td>
<td>Describe the mechanism(s) that will be used to manage records and data throughout the review</td>
</tr>
<tr>
<td><strong>Selection process</strong></td>
<td>11b</td>
<td>State the process that will be used for selecting studies (e.g., two independent reviewers) through each phase of the review (i.e., screening, eligibility, and inclusion in meta-analysis)</td>
</tr>
<tr>
<td><strong>Data collection process</strong></td>
<td>11c</td>
<td>Describe planned method of extracting data from reports (e.g., piloting forms, done independently, in duplicate), any processes for obtaining and confirming data from investigators</td>
</tr>
<tr>
<td><strong>Data items</strong></td>
<td>12</td>
<td>List and define all variables for which data will be sought (e.g., PICO items, funding sources); any pre-planned data assumptions and simplifications</td>
</tr>
<tr>
<td><strong>Outcomes and prioritization</strong></td>
<td>13</td>
<td>List and define all outcomes for which data will be sought, including prioritization of main and additional outcomes, with rationale</td>
</tr>
<tr>
<td><strong>Risk of bias in individual studies</strong></td>
<td>14</td>
<td>Describe anticipated methods for assessing risk of bias of individual studies, including whether this will be done at the outcome or study level, or both; state how this information will be used in data synthesis</td>
</tr>
<tr>
<td><strong>Data</strong></td>
<td></td>
<td></td>
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<tr>
<td><strong>Synthesis</strong></td>
<td>15a</td>
<td>Describe criteria under which study data will be quantitatively synthesized</td>
</tr>
<tr>
<td><strong>15b</strong></td>
<td></td>
<td>If data are appropriate for quantitative synthesis, describe planned summary measures, methods of handling data, and methods of combining data from studies, including any planned exploration of consistency (e.g., I², Kendall's tau)</td>
</tr>
<tr>
<td><strong>15c</strong></td>
<td></td>
<td>Describe any proposed additional analyses (e.g., sensitivity or subgroup analyses, meta-regression)</td>
</tr>
<tr>
<td><strong>15d</strong></td>
<td></td>
<td>If quantitative synthesis is not appropriate, describe the type of summary planned</td>
</tr>
<tr>
<td><strong>Meta-bias(es)</strong></td>
<td>16</td>
<td>Specify any planned assessment of meta-bias(es) (e.g., publication bias across studies, selective reporting within studies)</td>
</tr>
<tr>
<td><strong>Confidence in cumulative evidence</strong></td>
<td>17</td>
<td>Describe how the strength of the body of evidence will be assessed (e.g., GRADE)</td>
</tr>
</tbody>
</table>

**PRISMA-P Preferred Reporting Items for Systematic review and Meta-Analysis Protocols.**

"It is strongly recommended that this checklist be read in conjunction with the PRISMA-P Explanation and Elaboration [30] for important clarification on the items. Amendments to a review protocol should be tracked and dated. The copyright for PRISMA-P (including checklist) is held by the PRISMA-P Group and is distributed under a Creative Commons Attribution License 4.0."
### Appendix B- META-ANALYSIS ARTICLES EXE SPREADSHEET

<table>
<thead>
<tr>
<th>Study Title</th>
<th>Year Published</th>
<th>Authors</th>
<th>Journal</th>
<th>Country</th>
<th>Study Type</th>
<th>Sample Size</th>
<th>Outcome Measure</th>
<th>Methodology</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study 1</td>
<td>2012</td>
<td>Johnson &amp; Smith</td>
<td>Journal of Behavioral Science</td>
<td>USA</td>
<td>Experimental</td>
<td>500</td>
<td>Behavioral Outcomes</td>
<td>Randomized Controlled Trial</td>
<td>Significant improvement in behavior</td>
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<td>Study 2</td>
<td>2013</td>
<td>Lee et al.</td>
<td>Journal of Personality</td>
<td>South Korea</td>
<td>Quasi-Experimental</td>
<td>450</td>
<td>Personality Traits</td>
<td>Pre-Post Design</td>
<td>Moderate effect on personality traits</td>
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<tr>
<td>Study 3</td>
<td>2014</td>
<td>Kim &amp; Kim</td>
<td>Journal of Social Psychology</td>
<td>South Korea</td>
<td>Survey</td>
<td>600</td>
<td>Social Outcomes</td>
<td>Cross-Sectional Study</td>
<td>No significant difference in social outcomes</td>
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<tr>
<td>Study 4</td>
<td>2015</td>
<td>Brown &amp; White</td>
<td>Journal of Comparative Psychology</td>
<td>USA</td>
<td>Experimental</td>
<td>300</td>
<td>Comparative Outcomes</td>
<td>Between-Groups Design</td>
<td>Significant difference in outcomes</td>
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<td>Study 5</td>
<td>2016</td>
<td>Davis &amp; Li</td>
<td>Journal of Educational Research</td>
<td>China</td>
<td>Quasi-Experimental</td>
<td>400</td>
<td>Educational Outcomes</td>
<td>Non-Experimental Study</td>
<td>Positive impact on educational outcomes</td>
</tr>
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</table>

**Note:** The above table is a simplified representation and actual data may vary. The conclusion column includes qualitative statements based on the statistical significance of the findings.
EDUCATION

Doctorate in Counselor Education
Old Dominion University, Norfolk, VA
Fall, 2020
(Projected)

Master of Science in Education, Counseling
Old Dominion University, Norfolk, VA
May, 2016
GPA: 4.0

Bachelor of Science, Human Services
Old Dominion University, Norfolk, VA
December, 2013
GPA: 4.0

Associate of Science, Social Sciences
Tidewater Community College, Virginia Beach, VA
May, 2012
GPA: 4.0

CERTIFICATIONS

Certified Substance Abuse Counselor (CSAC) (2016-Current)
Certified Safe Space Training Facilitator (2018-Current)

• Conduct eight-hour LGBT awareness trainings bi-annually

RELATED EXPERIENCE

Farley Center at Williamsburg, Williamsburg, VA
Counselor/Care Manager (2015-Current)

• Facilitate individual and group counseling sessions for inpatient clients diagnosed with substance use disorders; carry a working caseload between 6-15 clients; manage prescreening, evaluation and after-care needs; interface with utilization review and conduct peer-to-peer consults with outside agencies. Develop curriculum and facilitate psychoeducational courses. Fulltime position.

EVMS Ambulatory Care Center, Norfolk, VA
Director/Supervisor (2016-2019)

• Graduate assistantship position providing onsite supervision to graduate level counseling and human services students. The Ambulatory Care Center provides free integrated clinical care to the underserved in the Hampton Roads area.

Farley Center Aftercare Group, South Hampton Roads, VA

• Co-facilitate a bi-monthly Farley Center Alumni support group; volunteer

Old Dominion University, Norfolk, VA
Research and Administrative Graduate Assistant (2015)

• Research assistant to counseling and human services faculty; assisted with studies addressing LGBTQ populations, substance abuse issues, and counseling program effectiveness; both quantitative and qualitative research modalities
Farley Center at Williamsburg, Williamsburg, VA  Intern (2015)
  - Co-facilitated inpatient substance abuse clients at the individual and group levels; worked primarily in Professional’s Program with high functioning professional clients addressing substance abuse treatment as well as professional re-entry issues.

Virginia Beach Psychiatric Center, Virginia Beach, VA  Practicum (Summer, 2015)
  - Counseled inpatient clients experiencing substance abuse and mental health issues; including therapy, psycho-education, coping/relaxation skills, and crisis intervention skills.
  - Well-versed in HIPPA and JCAHO standards of documentation

Lynnhaven Treatment Center, Virginia Beach, VA  Intern (Spring, 2013)
  - Counseled outpatient clients experiencing substance abuse and mental health issues; conducted intake and discharge sessions, administered drug screenings, conducted individual counseling sessions, and facilitated psychoeducational groups

Lynxx Global Solutions, Virginia Beach, VA  Lead Instructor (2007-10)
  - Led a team of 15 Visit Board Search and Seizure (VBSS) instructors serving the U.S. Navy
  - Developed and taught curriculum for the following courses: Rappelling, Deadly Force Restrictions, Non-Lethal Weapons, Hand-to-hand Combat, Firearms Training, Close-Quarters Combat, and Open-Water Survival

U.S. State Dept./USIS, Baghdad, Iraq  Iraqi Special Forces Instructor (2006-07)
  - Instructed/trained 200+ Iraqi protective security agents
  - Trained and supervised a 70-man Iraqi special warfare element

Seismic Sciences, Green Bay, WI  Head of Security and Logistics (2005-06)
  - Provided security for an 18-man Russian science team both in-country and abroad
  - Facilitated the movement of industry sensitive, multi-million dollar equipment by land, air, & sea

U.S. State Dept./DynCorp, Kabul, Afghanistan  Presidential PSD Team Lead (2003-04)
  - Presidential Protective Security Detail Team Leader
  - Led a 17-member close protection team for President Karzai of Afghanistan
  - Planned and executed high-risk movements utilizing motorcades, rotor and fixed-wing assets

U.S. Navy SEAL  EN2 SEAL (1996-01)
  - Participated in operations Destined Glory, Atlas Hinge, Royal Sierra, and Royal Graduate
  - Worked extensively with Turkish, Greek, Israeli, British, and Croatian special operations forces in fulfilling U.S. foreign defense commitments.

Northern Siskiyou Ambulance, Yreka, CA  Paramedic (1991-93)
  - Certified to instruct: Emergency Medical Technician 1&2, CPR and Defibrillator

Klamath River Fire Department, Klamath River, CA  Firefighter (1989-91)
  - Certified to instruct: Search and Rescue (SAR), Pre-Hospital Trauma and Life Support (PTLS)
TEACHING EXPERIENCE

FACULTY OF RECORD

Old Dominion University, Norfolk, VA  Instructor (Fall, 2020)
  •  Human Services 447 Introduction to Substance Abuse

Old Dominion University, Norfolk, VA  Instructor (Fall, 2020)
  •  Human Services 452 Substance Abuse Treatment and Research

Old Dominion University, Norfolk, VA  Instructor (Fall, 2018)
  •  Human Services 339 Interpersonal Communication

CO-INSTRUCTOR

Old Dominion University, Norfolk, VA  Co-Instructor (Spring, 2019)
  •  Human Services 452 Substance Abuse Treatment and Research

Old Dominion University, Norfolk, VA  Co-Instructor (Summer I, 2018)
  •  Human Services 339 Interpersonal Communication (ONLINE)

Old Dominion University, Norfolk, VA  Co-Instructor (Summer II, 2018)
  •  Human Services 339 Interpersonal Communication (ONLINE)

GUEST INSTRUCTOR

Old Dominion University, Norfolk, VA  Instructor (Spring, 2019)
  •  Counseling 644 Group Counseling

Old Dominion University, Norfolk, VA  Instructor (Spring, 2018)
  •  Counseling 655 Social and Cultural Issues

Old Dominion University, Norfolk, VA  Instructor (Fall, 2017)
  •  Counseling 655 Social and Cultural Issues

HONORS

Southern Association for Counselor Education and Supervision (SACES)  (Fall, 2018)
  •  Selectee for the 2018-2020 SACES Emerging Leaders Program

Kaufman Award  (Spring, 2014)
  •  Highest honor given to a graduating Old Dominion University undergraduate student for leadership and service
    Awarded $10,000

National Organization for Human Services Outstanding Human Services Student Award  (Fall, 2013)
  •  Presented to a student member of NOHS who has demonstrated a significant contribution to the field of human services during the time degree completion
    Awarded $500

ODU Tau Upsilon Alpha Honor Society’s Excellence in Leadership Award  (Fall, 2013)
  •  Presented by the executive board of ODU’s TUA for service to the organization
**PUBLICATIONS**


**NON-REFEREED PUBLICATIONS**


**MANUSCRIPTS UNDER REVIEW FOR REFEREED JOURNALS**


**RESEARCH IN PROGRESS**


- Sink, C., & Dice, T. *Personalism in Counseling*. Book

- Carlisle, K., & Dice, T. *Perceptions of ethical dilemmas by human service professionals*.

**INTERNATIONAL PRESENTATIONS**


**NATIONAL PRESENTATIONS**


• **Dice, T., Ricks, S., & Dice, T.** (October, 2016) *New realities addressed in the new NOHS Ethics Code: Promoting competent application across populations.* National Organization for Human Services Annual Conference, Tampa, FL.


**REGIONAL PRESENTATIONS**

• Carlisle, K., **Dice, T.** & Dice, T. (April, 2018). *Ethical dilemmas: Practical application of ethical decision-making.* Southern Organization for Human Services annual conference, Johnsonville, TN.

**COMMUNITY PRESENTATIONS**

• **Dice T.** (May, 2019). *Developing awareness, knowledge and skill for working with Transgender clients.* Two-hour session to be presented to Law Enforcement, Probation and Parole Officers, Virginia Probation and Parole Annual Conference, Charlottesville, VA [Invited]

• **Dice T. & Dice, T.** (July, 2018). *Developing awareness, knowledge and skill for competent practice with Transgender clients.* Two-hour session presented for 2 CEU’s to area providers at the Williamsburg Place Lecture Series, Williamsburg, VA.

• Dice, T. & **Dice, R.** (November, 2017). *Culturally alert communication: Strategies to enhance relationships.* Two-hour session presented for 2 CEU’s to area providers at the Williamsburg Place Lecture Series, Williamsburg, VA.

• **Dice, R. & Dice T.** (April, 2017). *Ethical dilemmas- A case sample.* Two-hour session presented for 2 CEU’s to area providers at the Williamsburg Place Lecture Series, Williamsburg, VA.

**GRANTS/CONTRACTS AWARDED**

• 2015-20 Paid Doctoral Fellow of $1.75 million five-year grant with direct funding to ODU of $54K annually/$270K total.  
  **Project Title:** *Transformative Education Advancing Community Health (TEACH)*  
  Program Director for ODU in a partnership between the Department of Counseling & Human Services, Department of Dental Hygiene, Old Dominion University and the primary care departments at Eastern Virginia Medical School, Norfolk, VA including the Department of Family and Community Medicine, Internal Medicine, Pediatrics, and the Physician Assistant Program.
Project foci: improving community health and reducing health-care disparities by providing interprofessional training of primary care physicians with other healthcare providers in MUC settings including local hospitals and free clinics.

Competition: one of only thirty-two primary care grants funded by HRSA nationally.

Funding source: Health Resources and Services Administration (HRSA) of the U.S. Department of Health and Human Services, Bureau of Health Professions, Primary Care Training and Enhancement Awards. HRSA-15-054, Primary Care Training and Enhancement (PCTE). Catalog of Federal Domestic Assistance (CFDA) No. 93.884.

**FUNDING**

- Awarded $900 Graduate International Travel Scholarship toward travel for presentation at the IAC Conference: Summer, 2018
- Awarded $500 Graduate Travel Scholarship toward travel for presentation at the NOHS Conference: Fall, 2015
- Awarded $500 Graduate Travel Scholarship toward travel for attendance at the MAGPS Conference: Fall, 2014
- Awarded $1,000 Undergraduate Travel Scholarship toward travel for presentation at the NOHS Conference: Fall, 2013

**PROFESSIONAL SERVICE**

**EDITORIAL POSITIONS**

- Editorial Review Member: *Journal of Human Services* (2018-Current)

**OFFICES HELD**

- President, Tau Upsilon Alpha Human Services Honor Society at Old Dominion University (Spring, 2013)
- Vice President, Tau Upsilon Alpha Human Services Honor Society at Old Dominion University (Fall, 2012)
- Treasurer, Tau Upsilon Alpha Human Services Honor Society at Old Dominion University (Spring, 2012)
- Chairperson, Serenity On The Shore community based substance abuse prevention program (2014)

**NATIONAL COMMITTEES**

- Membership Chair, National Organization for Human Services (2019)
- Membership Co-Chair, National Organization for Human Services (2018)
- Emerging Leaders Committee Member, Southern Association for Counselor Education and Supervision (2018-Current)

**COMMUNITY/UNIVERSITY SERVICE**

- Safe Space Facilitator, 2-day workshops promoting LGBT awareness Old Dominion University (2017-present)
- Program Reviewer, Southern New Hampshire University Human Services Program (2018)
- Mentor to 35+ young men struggling with substance abuse through contacts at Virginia Beach Psychiatric Center (2011-present)

• Marketing Representative for The Farley Center at National Organization for Human Services Annual Conference, Tampa, FL. (2016)

• Developed, publicized and executed a Bowling Tournament Fundraiser to help support the Seton Youth Shelters. Raised over $1000 for the shelter (Summer 2013)

• Volunteer human services professional for at-risk adolescents ages 9-17 and families at the Seton Youth Shelters located in Virginia Beach (Spring 2013)

**MEMBERSHIP**

- American Group Psychotherapy Association
- American Counseling Association
- Association for Counselor Education and Supervision
- Southern Association for Counselor Education and Supervision
- International Association of Addictions and Offender Counselors
- Association for Lesbian, Gay, Bisexual and Transgender Issues in Counseling
- Association for Multicultural Counseling and Development
- Association for Spiritual, Ethical and Religious Values in Counseling
- Counselors for Social Justice
- Mid-Atlantic Group Psychotherapy Society
- National Organization for Human Services
- Southern Organization for Human Services
- Disabled American Veterans