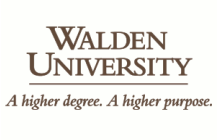

2019

Efficacy of a VA Residential Treatment Program for Co-Occurring Disorders

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This is to certify that the doctoral dissertation by

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has been found to be complete and satisfactory in all respects,
and that any and all revisions required by
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2019

Abstract

Efficacy of a VA Residential Treatment Program for Co-Occurring Disorders

by

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MSW, University of Kansas, 2001

BA, Minnesota State University Moorhead, 1998

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

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February 2019

Abstract

The problem of co-occurring substance abuse and mental health disorders among the veteran population can impact numerous aspects of a veteran's life, including self-esteem, relationships, employment, and legal issues. The Mental Health Residential Rehabilitation Treatment Program (MH RRTP) at the Saint Cloud, Minnesota VA Healthcare System is a program that provides residential treatment for this population. Identifying practical and beneficial treatment methods promotes better coping mechanisms for veterans and impacts social change by providing timely and cost-efficient care for veterans, while also leading the way for overall changes and improvements in other VA residential treatment programs. This study identified how using the integrated treatment model in the MH RRTP impacted depression, anxiety, and sobriety protective factors among 1,136 veterans who completed the program between 2016 and 2017, and if there were any significant differences in outcomes among various age groups and lengths of stay in the program. Outcome measures taken at pre and post treatment, using BDI-II, BAI, and BAM, were analyzed by using six one-within one-between (mixed-model) Analysis of Variance (ANOVA) tests. Significant interaction effects were noted for protective factors in length of stay and age group categories and for depression and length of stay. Significant main effects for within-subjects factors were consistently noted for all categories, indicating a reduction in depression and anxiety symptoms, while increasing protective factors for the veterans in this study. The results demonstrated that veterans responded favorably without regard to potential differences in age groups and lengths of stay.

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Dedication

This dissertation is dedicated to my husband, Tim, who has relentlessly provided his love, support, and encouragement throughout this journey.

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Finally, to the veterans I have served and will continue to serve, it has been my privilege to work with and learn from all of you. I thank each and every one of you for your sacrifices.

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Chapter 1: Nature of the Study

Introduction

Co-occurring disorders, sometimes described as *dual diagnosis* or *comorbidity*, refers to an individual having both a substance use disorder (abuse or dependence) and a mental health diagnosis that can be considered independent of each other (Substance Abuse and Mental Health Services Administration [SAMHSA], 2009). Studies have shown a high rate of comorbid substance abuse with psychiatric diagnoses including bipolar disorder, depression, anxiety disorders, psychosis, and antisocial and borderline personality disorders (Kelly & Daley, 2013). One of the most significant challenges for recovery from both types of disorders is relapse, which for substance abuse would constitute resuming use of a substance after remission and for mental health disorders would involve experiencing an increase of symptoms after a period of greater manageability (Decker, Peglow, Samples, & Cunningham, 2017; Reif et al., 2014).

Recovery is described by SAMHSA (2009) as engaging in a process, often over a long term, that focuses on internal change. To prevent relapse or increase the probability of maintaining recovery, it is important to have available treatments that provide a greater likelihood of symptom management, sobriety, and life satisfaction. Recovery-oriented approaches tend to emphasize the strengths and needs of the individual, rather than focusing entirely on the traditional "disease model" (Frost et al., 2017). Intervention approaches include motivational interviewing, harm reduction models for substance abuse, cognitive behavioral therapy, medications, and self-help therapies (Merrill & Duncan, 2014) or a combination of these modalities. There are various treatment

programs available, including programs for the veteran population, but there are questions about which provide a greater level of effectiveness. One of these treatments is residential programming, which consists of patients living onsite while receiving therapeutic interventions daily for an agreed-upon time frame. Within the Veterans Affairs (VA) Healthcare System, these programs are referred to as Mental Health Residential Rehabilitation Treatment Programs.

Problem Statement

The VA Healthcare System treats a variety of mental health and substance abuse concerns among military veterans, with treatment taking place in outpatient, inpatient, or residential settings. There are approximately 21 million veterans in the United States, and nearly 50% receive care through the VA, with the projected rate of those receiving mental health care expected to increase significantly over the next decade (Department of Veterans Affairs, 2016).

The increasing number of veterans receiving mental health care highlights the importance of identifying beneficial treatment options within the VA system (Kelly & Daley, 2013). When mental health symptoms are untreated, veterans are impacted in many areas, including family relationships, work functioning, self-esteem, and overall ability to cope (Karlin et al., 2012; McHugh, 2015). There is limited literature regarding residential VA programs focusing on treatment for veterans of all ages and eras who report difficulty with co-occurring disorders (Vest et al., 2014), which involve the presence of both a substance use disorder and a mental health problem such as

depression, posttraumatic stress disorder (PTSD) and other anxiety disorders, psychosis, or bipolar disorder.

The information acquired from this exploratory study adds to the currently limited body of knowledge on residential VA programs that treat co-occurring disorders such as depression, anxiety, and various forms of substance abuse. It also provides crucial information on the effectiveness of the integrated treatment model, which SAMHSA (2009) describes as using a variety of therapeutic interventions to allow it to be more individualized.

The Mental Health Residential Rehabilitation Treatment Program (MH RRTP) at the Saint Cloud VA Healthcare System in Minnesota has historically had two main tracks: the PTSD track (16 of 148 beds) and the co-occurring disorders (COD) track (the remaining 132 beds), which provides treatment to veterans with co-occurring mental health and substance use disorders. Notably, the PTSD and COD tracks were recently merged in 2018. However, until 2018, there were some veterans who chose to complete the COD track and then go on further to the PTSD track, which was a more intensive cognitive-processing program specific to PTSD. This study, however, focused solely on the co-occurring disorders track, which treats many mental health problems, including bipolar disorder, anxiety disorders, PTSD, and depression, in addition to substance use disorders. There are currently no published studies concerning treatment outcomes of the co-occurring disorders track at the Saint Cloud VA and very few about other VA co-occurring disorders residential programs or use of the integrated treatment model with

veterans. It is vital to establish whether current treatment interventions are benefitting the veteran population and to make positive changes in programming as necessary.

Purpose of the Study

The purpose of this study was to examine outcomes based on use of the integrated treatment model in the MH RRTP (SAMHSA, 2009). Secondary data that included self-report scores collected at the beginning and end of treatment from the Beck Depression Inventory-II, Beck Anxiety Inventory, and Brief Addiction Monitor were compared to determine the effectiveness of the service delivery model of MH RRTP. This was accomplished by analyzing secondary data to determine general program effectiveness of the integrated treatment model as it was used in MH RRTP and to specifically identify outcomes regarding length of stay differences. Comparisons in outcomes were made for veterans who participated in a brief treatment episode of care (33 days or less), a moderate time frame (34-46 days), and a longer program (47 or more days). An additional component of this purpose was to determine potential outcome differences among age groups. The outcome data for the age groups 21-30 years, 31-40 years, 41-50 years, 51-60 years, and over 60 years were compared. These age groups were chosen based on developmental stages and the ages of veterans who typically present to MH RRTP for treatment. This exploratory study provides general information that will allow for future studies to determine outcomes related to specific interventions, differences for males versus females, differences in outcomes for individuals with specific diagnoses, and long-term prognosis for participants of the program.

Research Questions and Hypotheses

There are unanswered questions related to how residential treatment may benefit the general veteran population in reducing depression and anxiety, whether there are differences among the various age groups served, and whether length of stay significantly impacts symptom reduction. These questions and concerns guided the research questions and hypotheses for this MH RRTP study:

Research Question 1: Are there differences in veterans' outcomes for overall depression symptoms from pre and post treatment based on length of stay (33 or fewer days, 34-46 days, and 47 or more days) in MH RRTP?

$H0_1$: There is no statistically significant difference in veterans' outcomes for overall depression symptoms from the start of treatment to completion based on length of stay (33 or fewer days, 34-46 days, and 47 or more days) in MH RRTP.

HA_1: There is a statistically significant difference in veterans' outcomes for overall depression symptoms from the start of treatment to completion based on length of stay (33 or fewer days, 34-46 days, and 47 or more days) in MH RRTP.

Research Question 2: Are there differences in veterans' outcomes for overall anxiety symptoms from pre and post treatment based on length of stay (33 or fewer days, 34-46 days, and 47 or more days) in MH RRTP?

$H0_2$: There is no statistically significant difference in veterans' outcomes for overall anxiety symptoms from the start of treatment to completion based

on length of stay (33 or fewer days, 34-46 days, and 47 or more days) in MH RRTP.

HA_2: There is a statistically significant difference in veterans' outcomes for overall anxiety symptoms from the start of treatment to completion based on length of stay (33 or fewer days, 34-46 days, and 47 or more days) in MH RRTP.

Research Question 3: Are there differences in veterans' protective factors scores from pre and post treatment based on veterans' length of stay?

$H0_3$: There is no statistically significant difference in veterans' protective factors scores from pre and post treatment based on veterans' length of stay.

HA_3: There is a statistically significant difference in veterans' protective factors scores from pre and post treatment based on veterans' length of stay.

Research Question 4: Are there differences in veterans' outcomes for overall depression symptoms from pre and post treatment based on veterans' age groups?

$H0_4$: There is no statistically significant difference in veterans' outcomes for overall depression symptoms from pre and post treatment based on veterans' age groups.

HA_4: There is a statistically significant difference in veterans' outcomes for overall depression symptoms from pre and post treatment based on veterans' age groups.

Research Question 5: Are there differences in veterans' outcomes for overall anxiety symptoms from pre and post treatment based on veterans' age groups?

$H0_5$: There is no statistically significant difference in veterans' outcomes for overall anxiety symptoms from pre and post treatment based on veterans' age groups.

HA_5: There is a statistically significant difference in veterans' outcomes for overall anxiety symptoms from pre and post treatment based on veterans' age groups.

Research Question 6: Are there differences in veterans' protective factors scores from pre and post treatment based on veterans' age groups?

$H0_6$: There is no statistically significant difference in veterans' protective factors scores from pre and post treatment based on veterans' age groups.

HA_6: There is a statistically significant difference in veterans' protective factors scores from pre and post treatment based on veterans' age groups.

Theoretical Framework

This study was based primarily on the integrated treatment model, which SAMHSA (2009) describes as having several key elements: concurrent treatments for mental health and substance abuse concerns, medication management, motivational and cognitive-behavioral interventions, and multiple formats, including group, family, and individual therapies. This theoretical framework encompasses several theories and interventions, including the transtheoretical model, which uses circular questioning and a "stages of change" approach. Within this model, there is a progression of behavior and

motivation changes, with stages including precontemplation, contemplation, preparation, action, and maintenance (Norcross, Krebs, & Prochaska, 2011). The clinician uses statements and questions that are thought to assist with self-motivation (Moyers & Houck, 2011).

Additionally, cognitive and behavioral theories are driving forces in the integrated treatment model. Cognitive theory "postulates that we develop habits of thinking that form the basis for our screening and coding of environmental input, categorizing and evaluating that experience, and making judgments about how to behave" (Walsh, 2010, p. 148). The theory asserts that individuals have thought patterns and core beliefs that influence the processing, assimilation, and accommodation of information (Walsh, 2010). Behavior theory emphasizes learning principles, such as classical conditioning, operant conditioning, and modeling behavior (Walsh, 2010).

Study Approach

A descriptive quantitative retrospective study was conducted to analyze scores from the Beck Depression Inventory II (BDI-II), Beck Anxiety Inventory (BAI), and Brief Addiction Monitor (BAM) by using secondary data. These tools are used at the beginning and end of treatment for veterans who complete a residential program (typical stay is between 27-60 days) and provide a thorough comparison of symptoms prior to and upon completing treatment, as well as the stage of change (precontemplation, contemplation, preparation, and action/maintenance) of the veteran's recovery. In this study, the independent variables were the ages of the veterans and the length of stay in treatment, and the dependent variables were the scores from the BDI-II and BAI, as well

as protective factors scores from the BAM. The length of stay groups included veterans who stayed 33 or fewer days, 34-46 days, and more than 46 days. These intervals were selected because they reflected the most common lengths of stay in MH RRTP. The MH RRTP study age ranges were divided as follows: 21-30 years, 31-40 years, 41-50 years, 51-60 years, and 61 years and over.

Random assignment was not feasible for this study, as all veterans who were accepted into MH RRTP were treated in the program, as opposed to some individuals being assigned to other treatment protocols such as outpatient programs. Analysis of variance (ANOVA) tests were conducted to compare pre and posttest means within the age and length of stay groups for the BDI-II, BAI, and BAM protective factors.

Definition of Terms

The following are definitions for key concepts in this study:

Co-occurring disorder: This term refers to the presence of at least one substance use disorder diagnosis along with at least one mental health disorder diagnosis. Another term that may be used interchangeably is *comorbidity*.

Dual diagnosis: This term is sometimes used interchangeably with *co-occurring disorder*.

Mental Health Residential Rehabilitation Treatment Facility (MH RRTP): A treatment facility in which the participants reside onsite while receiving daily interventions for their diagnoses, whether substance use, mental health, or co-occurring disorders. In this study, MH RRTP refers specifically to the Mental Health Residential

Rehabilitation Treatment Facility at the Saint Cloud VA Healthcare System, which is part of the Veterans Healthcare System (also referred to as VA).

Participants: The participants in this study were veterans who had participated in the MH RRTP at the Saint Cloud Healthcare System.

Substance use disorder: This term refers to the diagnosis of either substance abuse or dependence.

Veteran: This term refers to any individual who served for any length of time in a U.S. military service branch.

Veterans Affairs (VA)/Veterans Health Administration (VHA)/Veterans Affairs Healthcare System (VAHCS): These terms are often used interchangeably to describe the agency that provides healthcare and mental health services to the veteran population.

Length of stay: The number of days that a veteran resided in the MH RRTP. It is important to note that this is determined by the veteran him- or herself at admission (in the first few days after arriving) to the program. The protocol of choosing the length of stay is based on the veterans' preference and the need to have a discharge date in place. This also allows for other veterans to plan for admission (with a concrete date) to the program.

Assumptions

In this study it was assumed that the participants (veterans) answered honestly on the subjective scale questionnaires that they completed at admission and discharge from the treatment program. It was also assumed that the veteran sample was representative of the population of veterans who have experienced co-occurring disorders with moderate to

severe depression and/or anxiety symptoms, strengthened by the large sample in this study. Lastly, it was assumed that all veteran data were entered correctly by the MH RRTP staff.

Delimitations

The boundaries of this study were provided by several delimitations. The participants in this study were all adult veterans who had made the decision to enter MH RRTP for treatment of mental health and/or substance abuse disorders. Veterans may present to the Saint Cloud MH RRTP from various areas in the United States, but they are typically from communities around the Midwest area due to the location of the program. The veterans in this study were admitted to the program between January 1, 2016 and December 31, 2017 and discharged with "regular status," which is the term used to describe veterans who have successfully completed the program. Those discharged as "irregular status" were not included in the study, primarily due to these individuals not completing both the pre and posttests included in the study and leaving prior to their planned discharge date. Additionally, because one of the variables was length of stay, which was largely influenced by the veteran's choice, it would have been contradictory to include these individuals, in that they did not complete their initial length of stay request. As noted previously, due to a robust sample size, it is likely that the results are generalizable to members of the veteran population who have been diagnosed with co-occurring disorders and seek treatment in VA residential settings.

Limitations

There are general limitations to external validity in this study. These primarily involve lack of generalizability to the larger population. The results of this study only apply to veterans with co-occurring disorders who participate in residential treatment within the VA system and report difficulty with depression and/or anxiety symptoms. Because this study used a descriptive quantitative retrospective design involving secondary data, a true cause and effect cannot be established, in that it was not possible to manipulate the variables in this study. While the study does not allow for overall generalizability to the entire population, it can provide key information about the program's effectiveness for the veterans who have participated in the program.

There are several internal validity limitations that must also be considered for this study. The first is related to fidelity of the interventions. The MH RRTP clinicians were trained to facilitate the core groups of cognitive behavioral therapy (CBT) and stages of change/motivational interviewing (SCMI) in a similar manner, with the material being consistent in all groups, but personality and therapeutic styles may have impacted the outcomes to a certain extent. Additionally, while all veterans in MH RRTP received the core groups of SCMI and CBT, there were elective groups that some attended, which focused on other areas of concern, such as guilt/shame issues, emotions, and relationships. Therefore, this study was exploratory and focused primarily on the overall outcomes of participating in and completing the program. Additional limitations included not examining long-term treatment outcomes of MH RRTP, instead focusing specifically on treatment impact at program completion. Future studies may investigate outcome

differences based on the selection of elective groups, as well as differences among the MH RRTP teams (which are based on diagnosis and severity of symptoms), types of substances abused, outcome differences by gender and ethnicity/race, and long-term effects. Moreover, there was the risk of social desirability bias, a type of response that occurs when participants answer questions on self-report questionnaires in a way that makes them appear to be functioning better than they really are. However, this often occurs when participants are actively involved in a research study and may be less likely with archival data. Further, there was the potential for attrition bias (Salkind, 2010), in that individuals who did not complete both the pretest and posttest for the depression, anxiety, and substance abuse measures were not included in the study. It would be beneficial for future studies to examine potential reasons for not completing the posttest questionnaires. Veterans may have preferred not to answer the questions, missed the outcome group (completed close to discharge), or left the program due to an irregular discharge. Investigating the reasons behind irregular discharges in future studies might also provide useful information.

Finally, a limitation that should be considered relates to the potential for depression symptoms decreasing due to the duration of sustained abstinence during residential treatment. This has been studied in previous research, including via a meta-analysis of 22 studies from 1980 to 2014 (Foulds, Adamson, Boden, Williman, & Mulder, 2015). Although there is sometimes an increase in depression symptoms during early withdrawal, this meta-analysis demonstrated that there may be a correlation

between symptoms and duration of sobriety, often during the first 3 to 6 weeks of treatment (Foulds et al., 2015).

Significance of the Study

Mental health care access in the United States has become increasingly limited over the last 20 years, including for the population of veterans (Blais, Tsai, Southwick, & Pietrzak, 2015), partly due to perceptions of stigma, cost, and lack of insurance (Rowan, McAlpine, & Blewett, 2013). This lack of access has contributed to an increase in financial and legal difficulties, as well as relapse, family relationships, and societal problems, such as higher crime rates associated with behavioral aspects of substance abuse (Brorson, Arnevik, Rand-Hendriksen, & Duckert, 2013). Due to comorbidity of mental health and substance abuse disorders appearing to be prevalent among veterans, increased understanding of helpful methods of treatment is crucial (Kelly & Daley, 2013). Identifying the outcomes of MH RRTP is beneficial in increasing understanding of both strengths and limitations of the residential program (Brorson et al., 2013; Reif et al., 2014), as well as the effectiveness of the integrated treatment model with the veteran population and determining differences in outcomes among age groups and the number of days completed in treatment. This information may provide a wealth of knowledge for improving the MH RRTP and the numerous other programs at various VA facilities in the United States, thereby having the potential to positively impact thousands of veterans. The MH RRTP is a unique program and is being used as an example among several other residential programs in the VA system, many of which do not use the integrated treatment model, thus illustrating the crucial nature of determining program effectiveness.

Summary

This is one of few studies that has focused on a residential program for co-occurring disorders in the Veterans Healthcare Administration. While there have been numerous studies that have focused primarily on PTSD, very few have investigated co-occurring disorders that encompass a variety of co-occurring conditions including PTSD, depression, schizophrenia, anxiety, and bipolar disorder in addition to substance abuse. This study has provided crucial information in learning about the types of treatment that may be beneficial to veterans with co-occurring disorders, particularly with the presence of depression and anxiety, and the role of residential treatment for these individuals.

Chapter 2: Literature Review

Introduction

To have a clearer understanding of co-occurring disorders among veterans and programs available in the VA system, it is important to consider several aspects of working with this population. The military has a unique culture that significantly differs from civilian culture and carries over after an individual has left the military. Within the culture of veterans are several subcultures and noteworthy characteristics that are critical to remember when providing clinical services. Additionally, there are complex relationships between veterans with co-occurring disorders and suicide rates, as well as homelessness, chronic pain, traumatic brain injury (TBI), military sexual trauma (MST), and involvement in the criminal justice system (Castro & Kintzle, 2014; Crane, Schlauch, & Easton, 2015; Gilmore et al., 2016; Yoon, Petrakis, & Rosenheck, 2015).

Residential programming can offer advantages not found in other settings such as an outpatient clinic, which may include structure, recovery-based activities, and housing, while not being as authoritarian as an inpatient unit (Reif et al., 2014). Veterans using the Saint Cloud MH RRTP experience privileges, in that they are able to leave the residential unit while staying within the 200-acre VA campus and neighboring baseball field and VA golf course; after a few weeks, they have the possibility of taking therapeutic passes off-grounds. This can provide an opportunity to practice the skills learned in MH RRTP and then return to programming to process the experience. Veterans often report that this structure is beneficial in gaining more confidence and becoming more prepared overall for independence after treatment completion.

Relapse has traditionally been a concern of individuals who participate in any type of substance abuse or co-occurring disorders treatment program, as well as of staff who provide such interventions. While relapse remains a concern after individuals complete a residential program, studies have demonstrated that for those who leave treatment without "successful completion," there may be exacerbation of symptoms and difficulty maintaining motivation for recovery (Brorson, Arnevik, Rand-Hendriksen, & Duckert, 2013; Decker, Peglow, Samples, & Cunningham, 2017; Reif et al., 2014). Thus, it is imperative that a program offer the needed interventions and stability to assist an individual with continuing to work on maintaining a recovery-oriented attitude, which is what the MH RRTP strives to provide.

Literature Search Strategies

The following key words and combinations of these words were used for searching the literature: *veterans, substance abuse, mental health, depression, anxiety, co-occurring disorders, residential treatment, integrated dual diagnosis treatment, motivational interviewing, cognitive behavioral therapy*, and *integrated treatment model*. The databases and portals used to search for the previously mentioned key words were EBSCO, Thoreau, Google Scholar, and Science Direct. All databases offered by the portals were selected to elicit as many responses as possible.

Lack of Research on Veterans With Co-occurring Disorders

There has been a lack of research on residential programs that treat veterans with co-occurring disorders. Numerous studies have focused on residential treatment for veterans with PTSD and those with both PTSD and co-occurring substance abuse

disorders. However, very few studies have investigated co-occurring disorders among veterans who have other or additional problems, such as depression, generalized anxiety, bipolar disorder, and schizophrenia. The veterans in the MH RRTP present with a variety of diagnoses, including psychosis, depressive disorders, and various anxiety disorders, along with substance abuse or dependence.

Military Culture

The military has a culture of its own, and it is important to recognize and honor this when working with military veterans. The reasoning behind joining the military varies among individuals, but Hall (2011) described four main reasons: family tradition, escape, the benefits available, and identification as a "warrior." There are families with a tradition of joining the military, which confers a certain pride, leading to individuals enlisting. For other individuals, there are benefits, such as those provided under the GI bill, that can help those coming from lower income homes to go to school or otherwise better their lives (Hall, 2011). A "warrior" mentality is another potential reason for joining the military, which encompasses a purpose of protecting others and may be highly important to individuals (Meyer & Wynn, 2018). Finally, some military personnel determined that their life situation was dire enough that the military provided hope and a chance for a better future (Hall, 2011); such personnel may find within the military a family, something unavailable to them while growing up. There are various other reasons for joining the military, but these four are thought to be the most common (Hall, 2011).

Veterans

A *veteran* is defined as an individual who has served in a branch of the U.S. military. A crucial component in working with veterans is being familiar with military terminology, norms and belief systems of veterans, and the camaraderie that exists among this population (Meyer & Wynn, 2018). The identity of being a veteran is quite important and needs to be respected and honored by clinicians providing services (Meyer & Wynn, 2018).

Veteran Characteristics

There are numerous characteristics that clinicians should be aware of when working with veterans. During their military life, veterans may have experienced frequent separations from their families. They may continue to abide by a philosophy that the "mission must come first," may feel a level of detachment from nonmilitary life, and may maintain an authoritarian structure such as that typically experienced within all branches of the military (Meyer & Wynn, 2018).

Subcultures are present within the military that separate individuals into groups such as officers versus enlisted, which create some social distance within the military itself (Hall, 2011). Knowledge of a veteran's rank can be beneficial upon meeting with him or her initially, as this can provide information about potential viewpoints and attitudes, as it is common for officers' viewpoints to differ from those of lower ranking personnel (Hall, 2011). An additional consideration involves veterans often seeing clinicians as authority figures, which can render the establishment of rapport more challenging (Hall, 2011).

Another subculture within the military includes combat veterans (Meyer & Wynn, 2018) who may have served in war locations, such as Korea, Vietnam, Iraq, or Afghanistan. There are also conflicts that are not officially considered wars, but in which veterans still served in a combat environment. Communication among these individuals can be unique, particularly with trading "war stories" or sharing their experiences during service time. A shared trauma may also exist and is identified among those who experience PTSD symptoms. This can be a challenge for civilians to understand due to the shared experience of trauma and the bond it creates.

An additional cultural consideration to understand about veterans revolves around the "importance of the mission" (Carroll et al., 2016). Early in basic training, enlisted personnel are taught to see themselves as part of a team rather than as individuals; this principle is then reinforced throughout their military career. The idea of only trusting each other and training diligently for potential missions is a core component of the military (Hall, 2011). The unit and mission always come first, with "weakness" never being an option (Hall, 2011). It is important to note that there is truth to this philosophy, in that during missions, personnel can only trust each other (Hall, 2011). When they leave the military and become veterans, this mindset has become engrained in them.

The warrior mentality establishes stoicism and the need for (mission) secrecy, as these are necessary aspects of combat (Meyer & Wynn, 2018). This philosophy, along with the stigma associated with mental health issues and a fear of being perceived as "weak," can be a barrier for veterans seeking treatment (Teeters, Lancaster, Brown, &

Back, 2017). Gaining the trust of a veteran, due to these factors, can take patience, time, and empathy (Meyer & Wynn, 2018).

Co-Occurring Mental Health and Substance Abuse Disorders Among Veterans

The rate of co-occurring mental health disorders and substance abuse among the veteran population continues to be concerning, although there are some indications that rates of alcohol-use disorders are declining (Lan et al., 2016). A meta-analysis reviewing 37 studies between 1995 and 2013 in the VA system reported that the decrease in reported alcohol-use disorders may be due to increased awareness of alcohol abuse in the veteran population (Lan et al., 2016). However, the rates of both drug and alcohol abuse remain problematic overall. The authors (Lan et al., 2016) posited that these issues may be at least partly attributable to concurrent mental health symptoms that veterans are attempting to self-medicate.

A study conducted to determine rates of substance use disorders among veterans presenting for VA services the first time identified that 11% met criteria for a substance use disorder diagnosis (Teeters et al., 2017). Furthermore, the investigators noted a higher rate among veterans aged 18-25 compared to their civilian counterparts. Overall, within the groups of veterans (Teeters et al., 2017), those who were designated as Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF) had higher rates of both substance use disorders (SUD) and COD. The most prevalent comorbid disorders with substance abuse include major depressive disorder (Yoon, Petrakis, & Rosenheck, 2015; Zisook et al., 2016) and PTSD (Coker, Stefanovics, & Rosenheck, 2016). However, other psychiatric disorders that are noted to be problematic among veterans with

substance abuse include schizophrenia, obsessive-compulsive disorder, social phobia, panic disorder, and generalized anxiety disorder (Bonn-Miller, Harris, & Trafton, 2012).

An investigation reviewing all VA Healthcare System records was completed to determine changes in the rates of cannabis use disorders from 2002 to 2009 (Bonn-Miller et al., 2012). The researchers identified an increase of 59.12% for those with diagnoses related to cannabis use disorder from 2002-2009. Additionally, they discovered significant rates of other substance abuse issues among veterans with mental health issues, including increases in use of alcohol, amphetamines, cocaine, and opioids (Bonn-Miller et al., 2012).

Barriers and Other Factors Complicating Treatment

There are numerous factors to consider in working with veterans who have co-occurring disorders, including the high rate of suicide, TBI, MST, chronic pain issues, and barriers to treatment, such as stigma, probation and parole status, and homelessness. In the MH RRTP, these are all concerns that may be addressed during the treatment episode of care.

Veterans and Suicide Rates

The increase in veteran suicides over the last 10 years has become an important focus of attention in many studies (Bossarte, Claassen & Knox, 2010; Castro & Kintzle, 2014). It is estimated that the current number of suicides among veterans is 22 per day, or as many as 8,000 per year (Castro & Kintzle, 2014). There are often substance abuse and mental health issues present among veterans who are at highest risk for suicide, including PTSD, depression, anxiety, schizophrenia, and bipolar disorder (McCarthy et al., 2009).

A longitudinal study (Ilgen et al., 2010) examined National Death Index data and Veterans Health Administration patient records to investigate the relationship between veteran suicides and mental health diagnoses. Results of the study indicated a strong correlation between a psychiatric disorder diagnosis and increased suicide risk (Ilgen et al., 2010). Additionally, among male veterans, bipolar disorder was most strongly correlated with suicide, while substance abuse disorders were present more often than other psychiatric disorders for female veterans (Ilgen et al., 2010). Additional findings in an investigation of suicide rates among veterans (Hoffmire, Kemp, & Bossarte, 2015) led to the assertion that suicide rates declined for veterans who used VHA services from 2000 to 2010 (Hoffmire, Kemp, & Bossarte, 2015). This may suggest that veterans who do not use VHA services are at higher risk of suicide. This would provide additional evidence of the importance of having effective interventions in the VHA system as well as outreach to veterans who are not currently using VHA services.

Traumatic Brain Injury

TBI is often seen in post-9/11 veterans (Gros, Korte, Horner, & Brady, 2016), who were formerly referred to as OIF and OEF veterans. In this group of combat veterans, individuals were often involved in multiple tours and experienced numerous blasts resulting from improvised explosive devices (IEDs). Combined with substance abuse and mental health concerns, the presence of a TBI can result in a more complex treatment protocol. A study conducted by Gros et al. (2016) indicated a significant relationship among TBIs, PTSD, and substance abuse, particularly with alcohol. A review of VA records (Gros et al., 2016) between 2007 and 2012 revealed that of 66,089

post-9/11 veterans who screened positive for TBI, 72% reported moderate to severe cognitive impairments. Of those veterans, there was a significant number who also met criteria for PTSD and depression.

Chronic Pain

Veterans, particularly those who have been in combat, often have co-occurring pain issues, and use of substances may be an attempt to self-medicate for the pain experienced. This is an additional consideration in MH RRTP, where veterans are encouraged to participate in healthy pain management skills and methods. Studies have demonstrated a significant concern for veterans with concurrent pain issues. For example, Phillips et al. (2016) discussed pain and psychiatric comorbidities among post-9/11 veterans by conducting a multivariate analysis of covariance (MANCOVA) on differences among self-report measures of symptoms. They reported that no significant differences were noted for age, but there were higher rates across the 359 participants for moderate to severe pain, mood disorder, and anxiety disorders (non-PTSD) among those who met criteria for comorbidities (Phillips et al., 2016).

Military Sexual Trauma

The question of how MST relates to higher rates of substance abuse and co-occurring mental health issues was examined via a study reviewing records of 499,822 veterans who had served in Iraq or Afghanistan and completed the MST screening (Gilmore et al., 2016). The authors reported findings of significance for veterans with positive MST screens having higher rates of PTSD, substance use disorders, and depressive disorders (Gilmore et al., 2016).

Veterans and Homelessness

Making the issue of substance abuse and mental health issues among veterans even more complex is the high rate of homelessness that exists in this population (Yoon et al., 2015). An investigation of demographics with 300,000 veterans was conducted by using a VA system chart review. It was determined that a high rate of homelessness is often comorbid with substance abuse and mental health disorders (Yoon et al., 2015). Exact percentages of homelessness among veterans are difficult to attain due to the "point-in-time" counts that are conducted, which only identify individuals who can be located and counted (Tsai, Link, Rosenheck, & Pietrzak, 2016). However, it was noted in one study that 8.5% of veterans had reported being homeless at some point, while only 17.2% of those reporting using VA services to address this issue (Tsai et al., 2016). Additionally, the 2016 annual assessment of homelessness to Congress reported that there were nearly 39,471 homeless veterans (Henry, Watt, Rosenthal, & Shivji, 2016); although this figure had decreased by 46% since 2009, homelessness has remained a problem that may exacerbate co-occurring disorders.

Justice-Involved Veterans

Veterans who are involved with the criminal justice system often lack awareness about treatment options or are unable to get appropriate care due to their legal issues (Glynn et al., 2016). Veterans may also be at greater risk for legal problems, from driving violations to more extreme changes. For example, when individuals have been in a deployment situation with accompanying trauma, they learn to drive in a manner to avoid encountering an IED. When they return to the United States, this driving pattern has

become engrained, and veterans may receive moving violations on a more frequent basis than civilians (Crane, Schlauch, & Easton, 2015). Additionally, returning military personnel may experience difficulties with reintegration and continue to have a combat mindset, leading to other legal issues, including violent offenses (Crane et al., 2015).

Additional Barriers

There are numerous other barriers to treatment that have been identified among researchers. In some VA facilities, there are not enough mental health staff available, while other veterans may have competing basic needs or be ineligible for services (Glynn et al., 2016). Cost and lack of insurance have been problematic for individuals seeking treatment, particularly among the civilian sector (Rowan, McAlpine, & Blewett, 2013). Priester et al. (2016) asserted that when co-occurring disorders are left untreated, individuals face increased odds for medical illness, suicide, shorter lifespan, risk of homelessness and incarceration. The investigators completed a review of 36 articles to identify barriers to treatment. These included excessive wait lists, a lack of culturally competent and specialized services, and a lack of stable housing (Priester et al., 2016). The researchers also identified potential solutions including reducing "red tape," offering evening and weekend services, providing transportation options, and improving training for professionals (Priester et al., 2016). Data studied from 10,384 veterans who scored 8 or higher on the Alcohol Use Disorders Identification Test (AUDIT-C) indicated that only 3.9% were receiving treatment for substance abuse (Glass et al., 2010).

Working Through the Barriers

The concerns and barriers veterans may face during treatment are addressed concurrently, to the greatest extent possible, in the MH RRTP. There are various resources to assist with legal obligations, including assistance from a VA Justice Outreach Coordinator, steps that can be taken to assist with housing, and suicide risk assessments and interventions including formulation of safety plans. Veterans are provided information and interventions to assist with chronic pain in a healthier manner, including use of physical therapy and mindfulness techniques. If they are deemed to be at risk of having experienced a TBI, further assessments are completed. This approach is a major benefit to incorporating an integrated treatment model, as it not only addresses the co-occurring substance and mental health disorders, but also provides a type of wraparound service to make life stressors more manageable.

Mental Health Residential Rehabilitation Treatment Program

The history of the Saint Cloud MH RRTP is important to consider due to the significant changes made to the program over the past decade. Prior to 2007, the MH RRTP was primarily a substance use disorder program. Residential programs in the entire VA system began after the civil war, but at that time were called Veterans Homes and were run by veterans. In later years, they gradually began to change into psychosocial rehabilitation programs. There are currently 244 MH RRTP facilities in the VA system throughout the United States.

The Saint Cloud MH RRTP began in the 1950s and was primarily focused on substance abuse interventions, such as 12 step programming. In the past 10 years, the MH

RRTP has transformed into a co-occurring disorder treatment program and has also placed increased focus on safety. As identified by Jeremy Maurstad, the MH RRTP Domiciliary Chief at the time of this study, this includes 24/7 licensed staff, closed circuit television, medication management, keyless entry and a mental health design to maximize privacy, and safety for the veterans (J. Maurstad, personal communication, January 17, 2018). The Saint Cloud MH RRTP is unique in its approach with utilizing outcome measures, evidence-based treatment, and a constant continuous improvement loop by implementing objective measurements and pre and post-outcomes. There are several other MH RRTPs attempting to replicate the program being studied and one other facility has made a full transition in replicating the program successfully (J. Maurstad, personal communication, January 17, 2018).

The focus of this study, the Saint Cloud VA MH RRTP, is a 148-bed residential facility in the Veterans Affairs Healthcare System that specializes in treating veterans with substance abuse, mental health concerns and a combination of both issues, referred to as co-occurring disorders (CODs). The program uses several types of interventions, primarily in a group format, with a focus on a person-centered approach as noted in the integrated treatment model. Veterans, in consultation with their assigned primary case manager, determine their length of stay in the program, typically 27-60 days depending on the veterans' preference, problems and symptoms, housing status, and obligations outside of treatment. They are instrumental in identifying their treatment plan goals, objectives, and interventions.

Group Format

While two core groups, stages of change/motivational interviewing and enhancement (SCMI) and cognitive behavioral therapy (CBT), are mandatory, there are many other potential groups that veterans may choose from during their treatment episode of care. These include a focus on relapse prevention, mindfulness, acceptance and commitment therapy (ACT), PTSD symptom management, cognitive-processing therapy for PTSD, stress management, inner conflict, coping with guilt and shame, nutrition and cooking, chronic pain, sleep issues, and recreational therapy. Veterans also have access to peer support specialists via individual and group formats and attend a choice of SMART Recovery, Alcoholics Anonymous (AA), Narcotics Anonymous (NA), or Emotions Anonymous (EA). Veterans are also encouraged to utilize a fitness center, bowling alley, and therapeutic pool onsite, pending medical provider approval. They have access to yoga and other holistic approaches, as well as individual therapy upon request, in addition to their therapy groups. Veterans and their primary case manager discuss the various interventions available to establish a treatment plan based upon the strengths, needs, abilities, and preferences (referred to as SNAP) of the veteran. This is what truly makes the MH RRTP unique; veterans are offered a "buffet" of choices within the treatment program to truly fit their individual concerns and goals.

Multidisciplinary Approach

The elective groups are held for one to two weeks and are facilitated by various disciplines, including social workers, psychologists, peer support specialists, registered nurses, and recreational therapists. Additionally, veterans are seen by psychiatry as

needed, a medical provider, and pharmacist at admission and discharge from the program. Medication management is provided on site and there is a 24/7 staff presence that includes Licensed Practical Nursing staff and Social Service Assistants.

Quadrant System

The veterans in MH RRTP are assigned to teams based on the quadrant model (McDonell et al., 2012) as follows: Team 1 consists of veterans with high mental health needs and low or no substance abuse; Teams 2 and 3 consist of veterans with low to moderate mental health and moderate substance use disorders; Team 4 is for veterans with a high level of need related to both substance and mental health disorders; and Team 5 is for high substance abuse and low/no mental health issues. It is noted that there is some variation to the original quadrant model in that Quadrant 1 is typically for individuals with lower substance and mental health needs and are more often seen in an outpatient setting. Also, Team 5 is an addition to serve veterans who may have lower mental health issues, but a high level of substance abuse. In using this model, the veterans are on teams and participate in core groups with other veterans who have similar needs and problems.

The process of admission into MH RRTP. A veteran first begins the process of admission into MH RRTP by contacting a screening line that is answered by a Social Services Assistant (SSA) or Licensed Practical Nurse (LPN) who takes basic information from the veteran and assesses for any emergent needs. The veteran is given a time/date that a screener, either a master's level social worker (MSW) or registered nurse (RN) will be in contact to complete the full admission screening. Once this has been completed and

the veteran has been accepted to the program, an agreed upon date for admission is established. The veteran is admitted on that date, meets with a psychologist or social worker for an assessment and a medical provider for a history and physical exam. The veteran is assigned to a team based on the quadrant that is most appropriate as determined during the biopsychosocial assessment, while also considering the individual's needs and goals. The veteran then meets with a primary case manager, which may be an addiction therapist, MSW, or RN. At the treatment planning session, the veteran and primary case manager identify a discharge date, goals, and the core and elective groups that will be attended. The case manager is also responsible for conducting a mid-point treatment review and discharge planning throughout treatment. This individual also often provides facilitation of various groups in the program, including at least one of the core groups that the veteran attends (either the SCMI or CBT group).

Theories and Interventions

The integrated treatment model is the theoretical framework for this study and influences the interventions used in MH RRTP. This model includes several concurrent treatments for mental health and substance abuse concerns, medication management, motivational and cognitive-behavioral interventions, and multiple formats, including group, family, individual therapies, and a focus on recovery as opposed to the medical model. As part of this model, there is a great deal of focus on CBT and SCMI, the core groups in MH RRTP.

Integrated Treatment Model

The integrated treatment model is a recovery-oriented approach that has been identified as a best practice for COD (co-occurring disorders) treatment (Priester et al., 2016). Previous research has sometimes referred to this model as integrated dual disorder treatment (IDDT). The concept of treatment for both substance abuse and mental health issues concurrently became more widely accepted since the late 1980s (Minkoff, 1989) when studies indicated that treating these issues separately was not providing significant outcomes. While this model is not new, the practice of utilizing it among the veteran population within the VA system, specifically within residential settings, is more recent.

The integrated treatment model is multi-faceted and includes use of CBT, motivational enhancement via the stages of change, peer support, and a focus on self-determination and recovery. The qualities that make up an effective approach were described in a meta-analysis that was conducted to include 24 studies with 100 agencies (Torrey, Tepper, & Greenwold, 2011). The researchers used the meta-analysis primarily to explore the potential difficulty of implementation of an integrated treatment model and to identify the qualities that make up a well-rounded and beneficial treatment program for co-occurring disorders (Torrey et al., 2011). These included the importance of leadership, lower turnover rates in staff, consultant-trainer resources, available clinical supervision, and adequate finances for the program (Torrey et al., 2011).

There are several additional studies that identify this model as an effective approach to treatment, but only a few that focus on residential treatment for veterans. In one investigation, a meta-analysis of twelve studies was conducted to determine the

effectiveness of an integrated treatment model, which utilized a combination of CBT and motivational interviewing. They compared use of CBT and MI to a "treatment as usual" control group with individuals having both substance use disorders and depression (Riper et al., 2014). In this sample of 1,721 patients, it was noted that the combination of CBT and MI led to a small, but clinically significant effect in outcomes when compared with the control group (Riper et al., 2014).

Jones et al. (2011) also offered insights into using a combination of CBT and MI as a treatment for individuals who have both substance abuse and bipolar disorder. While this study was not based in a residential program, it did offer informative results of using a combination of CBT and MI as treatment for individuals who have both substance abuse and bipolar disorder (Jones et al., 2011). The researchers implemented a case study approach with five individuals diagnosed with co-occurring bipolar disorder and substance abuse. The authors asserted that this was the first study investigating the impact of CBT and MI for these comorbid disorders (Jones et al., 2011). The results indicated mixed responses, including three individuals who identified their primary substance as marijuana, and reported a reduction in their use following the intervention. Of the two individuals who identified alcohol as their primary substance, one decreased use significantly, while the other decreased only slightly (Jones et al., 2011). Although the results were mixed, and the participants were "complex" as described by the researchers (Jones et al., 2011), this study reported evidence of this therapy leading to positive results. A limitation to this study is the small number of participants, and it is possible

that more intensive delivery methods that are offered in MH RRTP may impact symptoms more substantially.

Another investigation was completed via a multi-center study of dual diagnosis programs at three sites with a similar treatment program curriculum (Schoenthaler et al., 2017) that used the integrated treatment model. Participants with co-occurring disorders were administered the Addiction Severity Index at admission to the program and then at one, six, and 12 months after discharge to evaluate sobriety maintenance. Approximately one-third of the participants reported no intoxication at 12 months after discharging from the program, which is a significant rate when considering the typically high rate of relapse for substance use disorders. Of the participants in this study who did relapse, many still reported a decrease overall in using or drinking behavior (Schoenthaler et al., 2017).

A smaller study investigated the integrated treatment model for CODs within an outpatient facility in Ontario (Milosevic, Chudzik, Boyd, & McCabe, 2017). The final sample of 29 participants completed readiness for change measures, a quality of life questionnaire, and other self-report measures, which indicated a reduction in drinking. However, the depression and anxiety self-report measurements varied indicating mixed results. The small sample size did pose a limitation to this study (Milosevic et al., 2017).

It has been stated that while residential treatment can impact positive outcomes, the effects are not generalizable outside of this environment (McKee, Harris, & Cormier, 2013). This notion has impacted residential programs to focus on changes for clients to practice their skills in more “real world situations” such as taking weekend or day passes

outside of the program. Additionally, changes to some residential programs to incorporate integrated treatment has been helpful in extending the skills in post-treatment environments. A study that focused on these changes was conducted in a residential program in Canada with initially 155 individuals participating in the study, and 86 completing the program (McKee et al., 2013). The program was transformed from a traditional residential program to an integrated treatment model and the authors investigated the impact of these program changes. Fidelity to the model was completed via consultations and scores on the Integrated Treatment Fidelity Scale to ensure that this remained a priority (McKee et al., 2013). Several measurements were used for self-report of symptoms including the Beck Depression Inventory-II, the Beck Anxiety Inventory, Brief Psychiatric Rating Scale, and Personality Diagnostic Questionnaire. The self-reported scores were compared at start, midpoint, and completion of the treatment to determine potential significant changes (McKee et al., 2013). They also compared the same measurements completed by a waitlist control group. The study demonstrated that treatment participation was associated with clinically significant improvements in symptom reduction, improvements in life satisfaction, and increased ability to maintain sobriety and life skills (McKee et al., 2013). It also illustrated the importance of strong leadership and low staff turnover in maintaining positive outcomes of the treatment interventions and the Integrated treatment model.

A study using a 28-day Minnesota model was described by the authors (Bergman, Greene, Slaymaker, Hoeppner, & Kelly, 2014) as using 12-step facilitation, CBT, and Motivational Enhancement interventions, which is similar to the protocol of the treatment

at the MH RRTP using the integrated treatment model. This investigation included 300 participants ranging from ages 18-24 who were recruits from Hazelden Center for Youth and Families. The researchers noted potential outcomes that were gathered at discharge, three months, six months, and 12 months post-discharge (Bergman et al., 2014) and compared a substance use disorder (no co-occurring mental health diagnoses) group with co-occurring disorders to determine differences in outcomes. The group with co-occurring disorders demonstrated greater symptom decreases as compared with the substance use-only group of participants, although positive overall main effects were present for both groups (Bergman et al., 2014).

Lastly, in a study completed by Toneatto and Calderwood (2015), participants were randomly assigned to receive either six individual sessions of alcohol-only treatment (ALC) or to an enhanced treatment consisting of six alcohol-only sessions, identical to the ALC group, followed by four sessions of anxiety management (ALCANX). It was found that including four additional sessions focusing exclusively on anxiety management made no significant difference with both treatments performing equally well. This demonstrated the impact of CBT as an effective therapy with or without the use of other interventions (Toneatto & Calderwood, 2015). However, the MH RRTP study emphasized use of concurrent SCMI/CBT.

Transtheoretical Theory

A major component to MH RRTP and the integrated treatment model is the transtheoretical theory, also referred to as the "stages of change." First presented by Prochaska and DiClemente (1982), the primary focus of this theory is to understand and

meet individuals where they are currently, rather than try to "push" them into being motivated for change. Prochaska and DiClemente were interested in examining what factors appear to motivate individuals for making sustained life changes and have studied this theory extensively over the past several decades, with modifications made over the years (DiClemente, Corno, Graydon, Wiprovnick, & Knoblach, 2017; DiClemente & Hughes, 1990; Prochaska, DiClemente, & Norcross, 1992; Velasquez, Crouch, Stephens, & DiClemente, 2016).

During that time, this theory has been identified as a major contributor to determining individuals' continued motivation for recovery. The stages of change include: pre-contemplation (the person is in denial that a problem exists), contemplation (aware that a problem exists and entertaining the possibility of change), preparation (preparing to change), action, maintenance and relapse, which then can begin a new cycle (Walsh, 2010). The primary therapies that have been associated with moving people from pre-contemplation through the other stages to action/maintenance are motivational interviewing and enhancement.

Motivational Interviewing and Enhancement Interventions

Motivation is a well-known predictor of abstinence and continued recovery-oriented attitudes following treatment episodes. There are various techniques involved in motivational interviewing (MI) and motivational enhancement therapy (MET), using the stages of change model, that include circular questioning, reflective listening, and education (Velasquez, Crouch, Stephens, & DiClemente, 2016). In the core MH RRTP group, SCMI, the curriculum and discussions focus on assignments that increase

motivational enhancement, such as improving communication, identifying pros and cons of substance abuse versus sobriety, discussing values, improving problem solving, and setting goals (Velasquez et al., 2016). The notion of neutrality is utilized to encourage changes in motivational levels with circular questioning being a crucial aspect of this technique with use of collaboration rather than confrontation (Walsh, 2010). This method is often referred to as motivational interviewing, which Van Wormer (2007) described as a "non-confrontational model based on the fundamental truth from social psychology that decisions to move toward change are more powerful if they come from within" (p. 22).

Interventions include providing empathy, reinforcing statements made regarding the desire to change, and asking questions that can elicit self-motivational statements (Walsh, 2010). As a preamble to circular questioning, reflective listening is crucial to develop changes in motivation levels. It has been described as the foundation of motivational interviewing (Rosengren, 2009) and includes expressing empathy and interest, while simultaneously challenging an individual gently by making statements rather than questioning. For example, instead of asking "so do you feel like you're not being heard?" one would make a statement "so you feel like you're not being heard" (Rosengren, 2009). Providing empathy and conveying understanding of how the client might be feeling allows the individual to confirm or deny the clinician's perceptions openly (Rosengren, 2009).

MI has been used for a variety of areas and age groups to promote the change process and utilize a client's strengths. The studies that demonstrate the usefulness of this strategy are numerous. One such study includes an investigation by Brown et al. (2015)

with adolescents, ages 13-17, who were diagnosed with both mental health and substance use co-occurring disorders. The participants were recruited during an inpatient hospitalization treatment episode and were randomly assigned to one of two groups, which included the typical treatment provided and another that added a MI intervention of two, 45-minute sessions (Brown et al., 2015). Outcomes were measured at start of treatment, completion of treatment, and again at one, six, and 12-months post discharge.

The authors (Brown et al., 2015) noted that general goals of the MI sessions focused on increasing understanding of substance abuse consequences and gaining knowledge about the behaviors impacting those consequences. Additional goals included increasing awareness of readiness for changes, pros and cons of substance use, and identifying goals and a change plan (Brown et al., 2015). The results of this study showed mixed results. While the results were significant for the MI group as compared to the control group with such areas as a decrease in use of substances, as well as defiant and rule-breaking behaviors, the results appeared to only sustain for the first six months after discharge (Brown et al., 2015). This may illustrate the point of identifying methods to continue utilizing the interventions more long-term to maintain motivational levels.

An extensive meta-analysis of studies completed between 2007 to 2017 was conducted by DiClemente, Corno, Graydon, Wiprovnick, and Knoblach (2017). The researchers reviewed 144 articles, which included 34 previous reviews, to determine efficacy of motivational interviewing and enhancement therapies on addictive disorders and behaviors. They concluded that very strong evidence exists for efficacy of motivational interventions with alcohol, tobacco, and marijuana addictions, as well as

moderate support for gambling (DiClemente et al., 2017). While there were fewer studies available regarding use of motivational enhancement therapy (MET) for other drugs, such as cocaine, opioids, or methamphetamine, the majority of those that are available have indicated a positive outcome for those utilizing MI/MET strategies (DiClemente et al., 2017). Additionally, the review included studies with individuals diagnosed with severe mental illness and indicated that the results demonstrate inconsistent findings. This leads to the conclusion that further studies are necessary to determine the impact of MI/MET on both mental health and substance use disorders besides marijuana and alcohol (DiClemente et al., 2017).

Studies are also being implemented to determine the effectiveness of brief MI/MET interventions that include just one or two sessions, which have had mixed results indicating that traditional longer-term MI/MET interventions may remain more appropriate in treatment. McDevitt-Murphy, Murphy, Williams, Monahan, and Bracken-Minor (2014) described an intervention in their study conducted with Iraq and Afghanistan combat veterans who received services in a VA primary care clinic. Their intervention, termed Project Strive (Successful Transition and Readjustment for Iraq/Afghanistan Veterans) was provided to veterans who scored at least an eight on the Alcohol Use Disorders Identification Test (AUDIT). Participating veterans completed a PTSD measurement in addition to the BDI-II and several other questionnaires (McDevitt-Murphy et al., 2014). They were then randomly assigned to one of two intervention groups, a control group of personalized drinking feedback or the intervention group of personalized drinking feedback and MI. The intervention group only received one

individual MI session, which usually was about 60 minutes total (McDevitt-Murphy et al., 2014). While this was a pilot study, with results similar in both conditions, it does demonstrate promising potential for brief interventions (McDevitt-Murphy et al., 2014), which have become more of a priority in the co-occurring disorders treatment field.

While the McDevitt-Murphy et al. (2014) study did not indicate a significant difference between the non-MI group versus the MI treatment group, another study reported significant results (Walker et al., 2017) with similar intervention strategies. The "Warrior Check-Up" study included 242 active-duty army personnel with alcohol use disorder as participants who were randomly assigned to either one session of MI with feedback or one session of education (Walker et al., 2017). All contact was completed over the telephone, which was a unique aspect to this study, in addition to both interventions including only one session (Walker et al., 2017). This particular model was designed specifically for army personnel to address the service-need gap for those who do not wish to participate in traditional types of treatment. The brief intervention (Walker et al., 2017) allows individuals to participate more anonymously and avoid major barriers that are often cited among this population, such as the high level of stigma and worries about confidentiality as it is "off the record." While there were noted limitations to this study, including the possibility of changes being due to monetary incentives for participation, it was still noteworthy that participants in the MI group significantly reduced drinking compared to the other group, from 32 drinks per week to 14 drinks per week at the six-month follow up (Walker et al., 2017). Motivational interviewing and enhancement is a key aspect of treatment in MH RRTP, as the two core groups in the

program, SCMI and CBT, focus on enhancing motivation for maintaining recovery and challenging distorted self-talk that lead to distressing emotions and unhealthy behaviors.

Cognitive and Behavior Theories and Interventions

Walsh (2010) reported that cognitive theory is focused on the thought process and is instrumental in how individuals evaluate various experiences, which then impact judgments about behavior. Behavior theory is focused on principles of learning, which often stems from the thought process. The combination of these theories has resulted in an intervention of CBT, the other primary therapy used in MH RRTP.

The therapy techniques identify the relationship between thoughts, feelings and behaviors with the emphasis on changing one's thoughts (Beck, 2011). It asserts that an activating event triggers or influences an individual's perceptions or beliefs, which influences the consequent emotions and behaviors (Beck, 2011). Interventions in MH RRTP include education about the relationship among thoughts, feelings and behaviors and homework assignments that challenge limited thinking patterns, conducted in the group setting. The process of recognizing and challenging these thoughts and core beliefs is referred to as cognitive restructuring (Walsh, 2010) by using thought journals and worksheets. Additionally, behavioral interventions are introduced during the group process, such as learning more effective communication methods, role playing, relaxation strategies, and confronting anxiety-provoking situations. Veterans with substance abuse issues are encouraged to challenge themselves by engaging in sober leisure activities.

CBT has been used as a therapeutic intervention for several decades. Within the integrated treatment model, CBT is an essential component to assisting individuals with

identifying problematic thinking patterns. There are numerous studies that demonstrate the usefulness of CBT for a variety of diagnoses and issues, including depression, anxiety, substance abuse, and PTSD. For example, Espejo et al. (2016) completed a study with veterans diagnosed with anxiety disorders. The veterans completed 12 sessions of group outpatient CBT (once per week for 120 minutes per session) at the San Diego VA. The study demonstrated positive results indicating that the treatment was particularly helpful for general distress, depressive symptoms, and anxious arousal (Espejo et al., 2016).

Another study (Brown et al., 2016) demonstrated the usefulness of CBT for decreasing suicidal ideation. The researchers implemented CBT for depression (CBT-D) in several VA facilities with a total of 882 patients. Of those individuals, 463 reported suicidal data at the three different time points that were evaluated via the BDI-II during a course of CBT-D treatment (Brown et al., 2016). The researchers reported that for veterans reporting suicidal ideation at baseline (mean scores were 33.4), the BDI-II mean scores decreased to 20.8 at the final assessment, which was a statistically significant reduction (Brown et al., 2016).

Hunter, Paddock, Zhou, Watkins, and Hepner (2013) completed a study utilizing four residential programs funded by Behavioral Health Services in Los Angeles County. The 299 participants were randomly placed into two groups, in which they received either residential treatment as usual or residential treatment enhanced with group cognitive behavioral therapy for depression (GCBT-D). The GCBT-D included 16 two-hour group sessions and used four modules that addressed thoughts, activities, interactions, and

substance use (Hunter et al., 2013). Outcomes were measured via self-report for depression symptoms with the BDI-II, the 12-item Short Form General Health Survey, and the Mental Health Composite Score (Hunter et al., 2013). The authors noted that the baseline measurements did not detect any significant differences, but at the six-month follow up significant differences were found. They also reported that the response rate for both groups was similar. The overall results indicated that GCBT-D was associated with improved mental health and substance use outcomes (Hunter et al., 2013). Notably, there were some differences among ethnicities, with Caucasians reporting more of a decrease in symptoms than other ethnicities, which the authors posited as providing evidence for the importance of increasing the availability of individualized treatment options (Hunter et al., 2013).

The use of CBT for anxiety and depression is well-known and accepted as an effective intervention technique among many clinicians and researchers. However, it has also been demonstrated as having a positive impact on other issues, such as insomnia, especially with veterans who have PTSD (Margolies, Rybarczyk, Vrana, Leszczyszyn, & Lynch, 2013) and is now being delivered in other formats, such as through digital methods (Luik, Kyle, & Espie, 2017). As with motivational enhancement strategies, CBT has become an integral part of MH RRTP treatment interventions within the integrated treatment model.

Residential Treatment Outcomes

Flynn and Brown (2008) demonstrated the importance of increasing the availability of interventions for co-occurring disorders, but also acknowledged the need

for further studies to make more conclusive arguments regarding program and intervention effectiveness. The results from residential treatment of co-occurring disorders within the general population have been varied. For example, the study completed by McKee, Harris, and Cormier (2013) included 86 participants diagnosed with co-occurring disorders in a small residential facility. They reported positive gains in coping skills and overall symptom management of the individuals who participated in the study.

A meta-analysis of residential programs demonstrated an overall moderate level of evidence for effectiveness of residential treatment (Reif et al., 2014), but noted some studies in the meta-analysis indicated no significant differences in outcomes for individuals in residential programming compared to other types of treatment, such as outpatient services. The authors of this study (Reif et al., 2014) included a concrete differentiation among low, medium, and high levels of intensity within types of residential programs. They defined the overall service goal, which included providing stable living environments while learning coping skills for recovery.

The authors aimed to determine effectiveness of residential treatment for substance abuse issues and completed a thorough search for articles from 1995 to 2012 (Reif et al., 2014). Several exclusion criteria were implemented, including studies that did not provide comparison groups, those that focused on adolescents, or those within a criminal justice system due to the likelihood of motivations that are different from other programs (i.e. being "forced" into treatment versus voluntary). The researchers then identified, reviewed, and compared eight reviews and 21 studies to determine a moderate

level of success among residential treatment programs (Reif et al., 2014). The authors recommended further research that identifies which individuals respond best to residential treatment, as population differences exist. They also recommended further studies specifically examining differences in outcomes based on length of stay length of stay in residential programs.

Giorgi, Ottonello, Vittadini, and Bertolotti (2015) completed a study of 560 patients who completed a 28-day residential program. All participants were diagnosed with an alcohol use disorder and just over half reported addictions to additional substances. Among the participants, 41% had a personality disorder diagnosis, 28% had mood disorders, 12% had an anxiety disorder, and a small percentage (4%) had psychosis (Giorgi et al., 2015). The treatment consisted of several daily group sessions focusing on motivational enhancement, education, and relapse prevention. They also were involved in various leisure activities and therapies that included relaxation and art therapy (Giorgi et al., 2015). A self-report measure, the Cognitive Behavioral Assessment Outcome Evaluation, was used to identify areas regarding impulsivity, anxiety, well-being, depression, psychological distress, and perception of change. The researchers (Giorgi et al., 2015) reported that much like previous literature, positive changes in symptom reduction and increases in well-being were apparent. They also indicated that the younger participants initially had higher levels of stress and anxiety, but a higher probability of positive change upon treatment completion (Giorgi et al., 2015).

Veteran-Specific Residential Treatment

While residential treatment in the civilian population has been the subject of numerous studies, there are fewer that specifically address the veteran population, particularly for co-occurring disorders, as many tend to focus on various forms of substance abuse rather than concurrent mental health disorders, or they focus on PTSD and co-occurring substance abuse. As an example, a study at the Salem Veterans Affairs Medical Center consisted of 137 veterans who participated in a 28-day residential program (Vest et al., 2014). While the study emphasized tobacco addiction, the investigators also identified the impact of treatment on substance use disorders at a one-month follow up with 97 of the veterans. The treatment of the program included CBT, education, and SCMI (Vest et al., 2014). They noted that at the one-month follow up, 90.7% (88 participants) had abstained from alcohol and 91.8% remained abstinent from other drugs (Vest et al., 2014).

Another study investigated post-treatment relapse five years after 207 veterans discharged from a VA residential program (Decker, Peglow, Samples, & Cunningham, 2017). The researchers included veterans who had completed successfully (regular discharge) and those who discharged prior to their established discharge date (referred to as an irregular discharge). The treatment program is open-enrollment and requires all veterans to stay for 60 days, rather than establishing a length of stay length of stay based on the veteran's preference. In this study, it was identified that 76% relapsed during the five-year time frame (Decker et al., 2017). However, those who did not complete the treatment, had a higher relapse than those who did (Decker et al., 2017). This

demonstrated the impact of completing a program successfully, as this in itself can be an important component of recovery.

A different perspective was discussed in a study completed by Cook et al. (2013) in which the researchers gathered information via 38 VA residential sites and interviewed 267 staff of these programs. Surveys were completed prior to the visits that including questions about policies, treatments, and organizational structure, followed by a two-day site visit (Cook et al., 2013). The qualitative study results indicated several important observations and concerns that should be considered regarding VA residential programs. These include mindfulness about changing needs in the veteran population and some differences in symptom presentation among age groups, including post-9/11 veterans tending to have more acute PTSD and other mental health symptoms, a lack of readiness and time demands for treatment, and other readjustment issues such as housing (Cook et al., 2013). There were also some concerns noted about potential disconnect among various eras of veterans. However, other individuals noted that often the older veterans provide a type of mentorship to the younger generation, which is beneficial for treatment outcomes for many in residential programming (Cook et al., 2013).

The notion of peer relationships impacting residential treatment success, as discussed by the VA staff in the Cook et al. study, was examined in an investigation specifically identifying how these relationship dynamics effect goals and outcomes in a VA residential program (Harrison, Timko, & Blonigen, 2017). The participants completed a personality inventory at the beginning of treatment, which indicated that overall veterans in treatment tended to have more interpersonal problems by one standard

deviation (Harrison et al., 2017). They also reported a significant association for specific personality styles having poorer outcomes, while those who had stronger connections among their peers reported more positive experiences in treatment outcomes (Harrison et al., 2017). Encouraging veterans in a residential program to maintain positive peer relationships appears to be an important component to their recovery.

Length of Stay and Age Groups

While the research that focuses on differences in outcomes for length of stay is limited, a study that did investigate this topic was completed by conducting a meta-analysis of 28 programs in the VA system with 1,307 participants (Harris, Kivlahan, Barnett, & Finney, 2011). The lengths of stay were divided into 15-30, 31-45, 46-60, 61-90, and more than 90 days. The programs with participants who stayed more than 90 days demonstrated the least improvement in the Addiction Severity Index measure (Harris et al., 2011). However, a significant limitation to this study is that the researchers only analyzed substance abuse programs in the VA (Substance Abuse Residential Rehabilitation Programs or SARRTPs), not co-occurring disorder programs. Therefore, they did not measure or treat concurrent mental health issues (Harris et al., 2011). Additionally, they did not describe use of the integrated treatment model in their analysis or the specific treatment curriculum or interventions in any of the residential programs.

A study by Coker, Stefanovics, and Rosenheck (2016) was completed by reviewing records of 12,270 veterans who had participated in intensive PTSD and co-occurring substance abuse programs throughout the VA Healthcare System from 1993-2011. The researchers measured outcomes from admission to four months after discharge

that focused on continued abstinence and decreased PTSD symptoms, such as irritability, hyperarousal, emotional numbness, flashbacks, and intrusive thoughts (Coker et al., 2016). The researchers reviewed outcomes from different types of programs, including short-term acute settings (less than 14 days), specialized inpatient PTSD programs (28-90 days), PTSD residential programs, and day hospital programs, which are similar to residential programs, but veterans reside in the community (Coker et al., 2016).

The outcomes of this study demonstrated greater efficacy among the longer length of stay programs, but the researchers noted that the improvement may be due to the intensity of the programs rather than the length of stay. They also discovered that those who were discharged prior to treatment completion (irregular discharge) had poorer outcomes for abstinence, than those who completed treatment on the discharge date that had been agreed upon during the admission process (Coker et al., 2016).

To investigate potential differences among age groups, Morse, Watson, MacMaster, and Bride (2015) completed a study to determine variations between older and younger individuals seeking treatment for co-occurring disorders. This was not a study with veterans, but rather the general population in the United States and Canada. Outcomes were not necessarily stressed in this study, but rather provided information about the participants' motivation for treatment and differences in symptoms and substances abused. They noted three main findings regarding pretreatment characteristics, types of substances abused among the different age groups, and external versus internal motivation for sobriety (Morse et al., 2015). The authors also reported pretreatment characteristics which differed among age groups. For example, the older adults tended to

abuse alcohol, while younger adults had typically used cocaine, opiates, heroin, marijuana, and amphetamines.

Regarding the results of treatment, there was little difference in readiness to change measures, but older adults typically stayed in treatment for a significantly shorter timeframe (Morse et al., 2015). Interestingly, the authors noted that older adults in the study tended to have more significant psychiatric concerns but participated in fewer days of treatment. However, the authors posited the possibility of these individuals placing a greater perceived importance on their mental health in contrast to the younger participants.

Veterans' Perceptions of VA Care

Blonigen, Bui, Harris, Hepner, and Kivlahan (2014) completed a study with veterans via phone surveys to gain information about their perceptions of care within the Veterans Healthcare System. They acknowledged that recovery is multifaceted and expressed concern about a gap in the literature for this population. They also recognized that previous research has noted a relationship between better outcomes and positive perceptions of care (Blonigen et al., 2014). The most important aspects identified in their care included perceptions of staff empathy and support, as well as collaboration with goal development that extends beyond symptom management. They noted the importance of staff assistance with life goals and recovery-oriented practices, such as working on additional goals that included family relationships, physical fitness, employment, and education (Blonigen et al., 2014).

Another study investigating the importance of veteran and staff collaboration with mental health and substance abuse recovery was completed by Hepner et al. (2014). A survey was completed via telephone interviews with a random sample of over 5,000 veterans. The individuals had received care for five main identified disorders: PTSD, schizophrenia, bipolar I, major depression, and substance use disorders (Hepner et al., 2014). Perceptions of care regarding timeliness, staff's recovery orientation, psychosocial services, and overall satisfaction were assessed during the phone interviews. Timeliness measures were broken down into routine versus urgent care. Psychosocial services included two main areas: perceived need for housing help and employment help.

Within the measure of staff orientation to recovery methods, there were seven aspects: asking about patient interests, including others in treatment planning, listening and respecting decisions, encouraging hope and high expectations, believing in the ability to make choices, introducing veterans to role models or mentors, and assisting with goal development and life goals (Hepner et al., 2014). The results gathered indicated that 42% were highly satisfied with their care at the VA, 74% reported being helped by the care received, but only 32% reported symptom improvement. The researchers indicated that positive perceptions of care are highly important in a variety of aspects, including actual health outcomes. This is an area that the VA has been working on improving by identifying characteristics of person-centered and recovery-based care, such as what is emphasized at the MH RRTP and the integrated treatment model.

MH RRTP and Veterans' Preferences for Treatment

The MH RRTP primarily utilizes self-report measures, including an anonymous perceptions of care form, use of a veterans council that meets weekly with management staff, and an anonymous card that can include complaints, concerns, or positives about the program (J. Maurstad, personal communication, January 17, 2018). This is in addition to the outcome-based measurement scales (the BDI-II and the BAI) that identify potential progress in MH RRTP. The veterans' perceptions of the program are central in making improvements with the program and are considered part of the "continuous improvement loop" in MH RRTP. The policies of all VA MH RRTPs include that a veteran's strengths, needs, abilities and preferences (SNAP) are the focus rather than illness and symptoms. Additionally, veterans are encouraged to utilize community and other supports that assist in success of their individual recovery and participate actively in their treatment planning, including their therapy groups and interventions.

Summary

The length of stay differences among outcomes for veterans attending residential treatment in the VA system and potential variations among age groups are important components in understanding the effectiveness of MH RRTP. These two aspects of veteran-focused treatment have been minimally researched. Additionally, the role of veterans' preference in establishing a length of stay length of stay in MH RRTP (up to 60 days with rare exceptions for more than that), which is discussed at admission, is an important consideration. The information that may be discovered can be instrumental in

making changes and impacting other residential facilities in both the VA and with the general population.

Chapter 3: Research Method

Introduction

The purpose of this descriptive quantitative retrospective study was to examine whether MH RRTP impacts a decrease in depression and anxiety and improves "protective factors" for recovery, particularly with regard to length of stay in treatment and age. This was accomplished by using secondary data gathered from veterans who participated in the MH RRTP during calendar years 2016 and 2017. The data were collected during this time frame at the start and completion of treatment for staff to examine program impact and had not been used in any previous studies. This information may be useful for staff of the program and other VA residential facilities to consider in program development. A descriptive quantitative retrospective study was conducted because it allowed for an understanding of differences in Beck Depression Inventory-II (BDI-II), Beck Anxiety Disorder (BAI), and Brief Addiction Monitor (BAM) protective factors scores from the start to completion of treatment by using archival data.

This chapter addresses the components of this retrospective study, including the population studied, sampling, and data procedures, followed by a description of the instruments used in the study. Lastly, the variables, research questions, and hypotheses are outlined, along with the research design, data analysis, and limitations of the study.

Population

The participants of this study were U. S. military veterans who served in any of the branches of the military, received discharges that were either Honorable or General—Under Honorable Conditions, and participated in the MH RRTP at the Saint Cloud VA

Healthcare System. In 2017, the VA began accepting veterans for specific types of care on an individualized basis who had received discharges related to Other Than Honorable Conditions. There had been a very limited number of veterans in MH RRTP with this status since the recent policy change, and it was unlikely that, if included, their results would have impacted the data significantly. The Saint Cloud VA is part of VISN 23 and serves areas of Minnesota, North Dakota, South Dakota, Wisconsin, and Iowa. However, it is not unusual for veterans from other areas of the United States to seek services at this VA facility.

Based on 2016 demographic data collected by MH RRTP staff, the veterans who participated in the MH RRTP were primarily Caucasian (80%), followed by African American (9%), and Native American (5%). Other ethnicities (less than 1% for each) represented among participants included Hispanic, Pacific Islander, and Asian. Approximately 4.5% of the veterans did not answer questions about race/ethnicity. Participant ages varied but tended to range from 21-72 years, with occasionally veterans in their mid to late 70s participating, and rarely, those in their 80s or 90s. Most of the veterans participating in this MH RRTP were male, but there were typically 10 or fewer female veterans in the program at any given time. The veterans participating in this study had mental health and/or substance abuse disorder diagnoses. The participants had sought treatment for these disorders on a voluntary basis, although they may have experienced legal issues resulting in a requirement to complete some type of treatment (not necessarily a residential program). The MH RRTP requires that veterans accepted to the program are medically stable enough to effectively participate and able to conduct

themselves safely in a residential environment. The program does not accept individuals who are under commitment (admission to an inpatient program, rather than residential, is typically more appropriate). However, in some cases, assessed on an individual basis, the MH RRTP may accept those under a "stay of commitment" which differs from a full commitment.

The majority of veterans in MH RRTP have a co-occurring disorder (both substance abuse and mental health concerns), but the most common diagnoses treated in MH RRTP include major depressive disorders, PTSD and other anxiety disorders, bipolar disorder, and alcohol-use disorders. Additionally, a smaller percentage of veterans may present with schizophrenia or other psychosis, personality disorders, and other substance use disorders including those involving cannabis, opioids, methamphetamines, and cocaine.

Sampling Procedure

The average number of veterans who participate each year in MH RRTP is approximately 1,100-1,300 with a total of 2,631 individuals participating in 2016 and 2017. However, after implementing several exclusion criteria, the overall usable sample size decreased to 1,136 total participants. Exclusion criteria applied to participants who received an irregular discharge (resulting in noncompletion of initially established days in treatment) and those who did not complete both a pre and posttest for at least one of the measurements. These participants might have missed either the initial or discharge outcome group when participants were asked to complete the pre and posttest BDI-II, BAI, and BAM, in addition to other outcome measures. Another possibility was that they

discharged from the program prior to completing these instruments due to extenuating circumstances, such as a family emergency or behavioral concerns, prompting an irregular discharge. An additional exclusion criterion was implemented for veterans who attended the MH RRTP co-occurring disorders track and then transferred directly to the PTSD track, as this increased the length of stay length of stay by 49 days and was consecutive attendance in two separate tracks of MH RRTP.

The original data included the date of admission and discharge, the pre and post treatment BAI, BDI-II, and BAM scores, and the ages of the veterans. The data were divided and coded into five age groups and three lengths-of-stay groups. The BDI-II and BAI pre and post scores were analyzed based on these groups. Minimal range scores on the admission measurements for the BDI-II (0-13) and BAI (0-9) were excluded to allow for a more accurate measure of symptom improvement among veterans with depression and anxiety.

The necessary sample size was calculated using G*Power 3.1.9.2 (Faul, Erdfelder, Lang, & Buchner, 2007), which is widely known to be an accurate and respected manner of identifying appropriate sample sizes. A sample size analysis was conducted for the intended analysis, a repeated measures within-between ANOVA. For a repeated measures within-between ANOVA with a medium effect size ($f = 0.25$), an alpha level of 0.05, a power of .95, five groups, and pre and post treatment measures, the minimum sample size necessary to achieve statistical validity was 80 participants. Specifically, at least 16 participants per group were necessary for the age categories, and

approximately 27 per group were necessary for the length of stay categories. All usable cases were analyzed for the purposes of this study, establishing a robust sample size.

Data Collection Procedure

Archival (or secondary) data for this study were used from the Saint Cloud VA MH RRTP. These data were collected during 2016 and 2017 using the self-report measures of the BDI-II, BAI, and BAM, as part of the Veterans Integrated Service Network (VISN) 23 (there are 23 total VISNs in the VA system). This service is maintained by VA Midwest Health Care Network Managerial Cost Accounting & Analytics (MCAA), including several of the instrument scores from MH RRTP data.

The MCAA software that is used by the VA is a product from Lexmark Enterprise Services and Perceptive Software's Acuo Vendor Neutral Archive (VNA), and it consolidates data from eight different states. It is maintained by program analysts, a program manager, and a program operations manager employed by the VA throughout VISN 23. Within these data are self-report measure outcomes, including the BDI-II, BAI, and BAM, that include measures at the start of treatment and again at completion. In order to review the data, approval must be granted by the VA Institutional Review Board (IRB). This study was approved by the VA IRB (Appendix A) and Walden University IRB (approval # 09-20-18-0499295).

Data collection from the participants occurred within the first 3 days of arrival to MH RRTP. Upon arriving to the MH RRTP, veterans were scheduled for an orientation and outcome group, where they were given several instruments to complete, including the BDI-II, BAI, and BAM. However, if a veteran did not attend this group (forgot or

disregarded it on his or her schedule) the pretest measure would not be collected, which would render any posttest results for that veteran as unusable in this study. Veterans who attended the group provided informed consent, completed a paper form for these instruments, and included their names and the last four digits of their social security numbers as identification. The information on the BDI-II, BAI, and BAM instruments was included in veterans' charts and inputted via the Mental Health Graphical User Interface (GUI), which is a program in the Computerized Patient Record System (CPRS) chart that allows for input of numerous specific instruments and is stored via the MCAA.

A Social Services Assistant (SSA) working in MH RRTP also inputted the BDI-II, BAI, and BAM scores into an Excel document kept under a locked password. The paper versions of these instruments were then shredded. The same procedure was used for the discharge process; veterans attended the outcome group one to two days before discharge and completed the BDI-II, BAI, and BAM once again, after which the information was included in their charts and the Excel document and the paper form was shredded. This data have not been previously published or used for purposes outside the facility.

Instrumentation

Three specific self-report measures were used in this study to analyze outcomes in the MH RRTP: the BDI-II, BAI, and BAM (protective factors scores), which are relevant to the symptoms and problems that are most represented in the members of the veteran population who seek services at the MH RRTP. Permission to use the instruments within this study was granted by the publishers (Appendices B and C).

Beck Depression Inventory-II

The BDI-II (Subica et al., 2014) is a 21-item self-report measurement tool that specifically addresses depressive symptoms. This widely used instrument was first established in 1961 (Beck, Mendelson, Mock, & Erbaugh, 1961) as the BDI with numerous studies and evaluations since that time (Beck, Steer, & Garbin, 1988; Lopez, Pierce, Gardner, & Hanson, 2013; Steer, Ball, Ranieri, & Beck, 1999) to eventually become the BDI-II. Questions on the BDI-II focus on areas such as difficulty with sleep, suicidal thoughts, feelings of worthlessness and guilt, loss of pleasure, agitation, fatigue, loss of appetite, and concentration problems (Subica et al., 2014). Scores may range from 0 to 63. Scores ranging from 0 to 13 represent minimal symptoms, while 14 to 19 is the mild range, 20 to 28 is moderate, and over 28 is the severe category (Subica et al., 2014). The instrument takes approximately 10 minutes to complete and requires a fifth- to sixth-grade reading level.

The internal consistency for this instrument ranges from .73 to .92 (Beck, Steer, et al., 1988) and has strong support as a screening instrument for overall depressive symptoms (Subica et al., 2014). In a study of 575 adult participants receiving treatment in an outpatient facility, numerous tests for validity and reliability for the BDI-II were completed (Subica et al., 2014). Researchers reported that the BDI-II total score strongly correlated with the Behavior and Symptom Identification Scale (BASIS)-24 Depression/Functioning subscale ($r = .79$, $p < .001$) and the BASIS-24 overall score ($r = .82$, $p < .001$), demonstrating likely convergent validity. Discriminant validity was suggested via intercorrelations between the BDI-II total score and the BASIS-24

substance abuse (r =.13, $p < .001$) and psychosis (r = .24, $p < .001$) measures (Subica et al., 2014). The BDI-II has demonstrated validity and reliability when administered to the veteran population. A retrospective study completed by Palmer et al. (2012) was completed with a sample of 310 veterans who had been administered the BDI-II as part of an evaluation for depression in an outpatient VA polytrauma clinic. The researchers (Palmer et al., 2012) reported a high level of reliability (a = 0.93) for this veteran sample, with a mean BDI-II total score of 21.20 (SD = 11.76; range = 0–51).

Beck Anxiety Inventory

The BAI is a 21-item self-report measurement that focuses on various symptoms of anxiety, including loss of interest and enjoyment, feeling tense, panic, restlessness, and overall worrying thoughts (Bardhoshi, Duncan, & Erford, 2016). The BAI was initially developed in 1988 (Beck, Epstein, Brown, & Steer, 1988), and in 1993 a revised manual was published. The BAI has a potential score of 0 to 63, with minimal symptoms in the 0-to-9 range, mild to moderate symptoms in the 10-to-18 range, moderate to severe in the 19-to-29 range, and severe symptoms in the 30-to-63 range.

An extensive meta-analysis reviewing 192 studies from 1993 to 2013 concluded that the BAI has strong internal consistency, test–retest reliability, and structural validity (Bardhoshi et al., 2016). Specifically, when the results from 117 studies were combined with a sample size of 43,932 participants to determine consistency, an alpha of .91 was found. To determine test-retest reliability, the researchers were able to use 18 of the studies and weight them (2,800 total participants) to yield a coefficient of .65 (Bardhoshi et al., 2016). In testing for convergent validity, the Pearson r ranged from .24 to .81

(Bardhoshi et al., 2016). The authors determined that given these scores, the BAI largely demonstrates a high level of validity and reliability as an instrument.

Brief Addiction Monitor

The BAM is a 17-item self-report measure developed by researchers affiliated with the Center of Excellence in Substance Abuse Treatment and Education (CESATE) and the VA (Cacciola et al., 2013). Two of the questions on the BAM have subsets depending on the answer to the initial item. For example, the questionnaire asks about use of certain substances, and with a "yes" answer, it then expands on additional types of substances. The BAM provides information regarding perceptions of physical health, use of substances, cravings, confidence level for not using substances, impact of religion or spirituality on recovery, and overall satisfaction in progress toward recovery goals (Cacciola et al., 2013). There is a specific focus and identification upon tallying the results that notes the risk factors and protective factors scores. This provides an overall understanding of how participants perceive their recovery and allows a clinician to gain more knowledge regarding areas of concern. It is noteworthy to recognize that there are several variations of the BAM, including the BAM-C, which is open-ended rather than having specific answers to choose from, and the Brief Addiction Monitor-Intensive Outpatient (BAM-IOP), which uses a 7-day reference rather than the 30-day reference of the original BAM. The MH RRTP uses the BAM-IOP, which generally asks about the past 7 days and confidence over the next week to maintain sobriety/recovery-oriented practices.

A disadvantage of the BAM is that because it is a relatively new instrument, there are only a few studies that have investigated its psychometrics. However, it is being used regularly within the VA for the determination of substance abuse treatment effectiveness and is one of the main instruments for MH RRTP, in addition to the BAI and BDI-II.

Cacciola et al. (2013) developed the BAM after noting shortcomings with previous instruments used to assess change during SUD treatment. The researchers completed this endeavor in two phases, which included actual instrument development followed by a study to determine psychometric properties. The authors completed the study by enlisting 175 patients at a VA outpatient substance abuse treatment program. They reported (Cacciola et al., 2013) support for the BAM as having good test-retest reliability and predictive validity.

Another study examining the validity and reliability of the BAM was completed with 810 veterans in a Midwestern VA substance abuse treatment program (Nelson, Young, & Chapman, 2014). It is noted that these researchers used a slightly different version of the BAM (the discrete form or BAM-D), whereas the Cacciola et al. (2013) study used the BAM-C (continuous form). The primary difference between the two measures is that the items on the BAM-C use a continuous response, while the BAM-D uses a Likert-type scale response, which is consistent with the BAM used in MH RRTP. The study by Nelson et al. (2014) reported that the BAM-D lacked a reliable factor structure; however, the authors also reported that the risk/use questions appeared to be reliable when analyzed separately. These measures also were reported to have an acceptable level of divergent and convergent validity. Further, they noted that none of the

instruments used in this study, including the BAM-D, were reliable predictors of program completion (Nelson et al., 2014). However, this variable was not addressed in the MH RRTP study, as the primary focus for use of the BAM was a comparison of the protective factors scores at the start and end of treatment.

The MH RRTP study, using the BAM-IOP, included the tally of responses to the protective factors questions (Items 9, 10, 12, 13, 14, 16) that were compared at the start and end of treatment. The developers (DePhilippis & McKay, n.d.) recommended comparing the protective factors scores at the start and end of treatment as this provides an overview of participants' perceptions of their recovery and ability to maintain recovery-oriented activities and attitudes, with the goal being that the score increases by the end of treatment. A high score indicates greater protective factors, with the range of 0 to 24. The protective factors questions include information about attendance of self-help meetings, confidence in not using alcohol or drugs over the next 7 days, religion or spirituality supporting recovery, time spent at work, school, or volunteering, whether enough legally gained income is available, and if supportive friends or family had been contacted within the past 7 days. The developers assert, among other benefits, the BAM can determine effectiveness of interventions, one of the primary goals of this MH RRTP study (DePhilippis & McKay, n.d.).

Variables

In this study, the independent variables were the ages of the veterans (21-30 years old, 31-40, 41-50, 51-60 and over 60 years of age) and the length of stay in treatment (33

or less days, 34-46 days, and 47 or more days). The dependent variables were the scores from the BDI-II, BAI, and BAM (protective factors measurement).

Research Questions and Hypotheses

There are questions related to how residential treatment may benefit the general veteran population, if there are differences among the various age groups served, and whether length of stay significantly impacts symptom reduction. These questions and concerns have guided the research questions for this MH RRTP study, which included:

Research Question 1: Are there differences in veterans' outcomes for overall depression symptoms from pre and post treatment based on length of stay (33 or fewer days, 34-46 days, and 47 or more days) in MH RRTP?

$H0_1$: There is no statistically significant difference in veterans' outcomes for overall depression symptoms from the start of treatment to completion based on length of stay (33 or fewer days, 34-46 days, and 47 or more days) in MH RRTP.

HA_1: There is a statistically significant difference in veterans' outcomes for overall depression symptoms from the start of treatment to completion based on length of stay (33 or fewer days, 34-46 days, and 47 or more days) in MH RRTP.

Research Question 2: Are there differences in veterans' outcomes for overall anxiety symptoms from pre and post treatment based on length of stay (33 or fewer days, 34-46 days, and 47 or more days) in MH RRTP?

$H0_2$: There is no statistically significant difference in veterans' outcomes for overall anxiety symptoms from the start of treatment to completion based on length of stay (33 or fewer days, 34-46 days, and 47 or more days) in MH RRTP.

HA_2: There is a statistically significant difference in veterans' outcomes for overall anxiety symptoms from the start of treatment to completion based on length of stay (33 or fewer days, 34-46 days, and 47 or more days) in MH RRTP.

Research Question 3: Are there differences in veterans' protective factors scores from pre and post treatment based on veterans' length of stay?

$H0_3$: There is no statistically significant difference in veterans' protective factors scores from pre and post treatment based on veterans' length of stay.

HA_3: There is a statistically significant difference in veterans' protective factors scores from pre and post treatment based on veterans' length of stay.

Research Question 4: Are there differences in veterans' outcomes for overall depression symptoms from pre and post treatment based on veterans' age groups?

$H0_4$: There is no statistically significant difference in veterans' outcomes for overall depression symptoms from pre and post treatment based on veterans' age groups.

HA_4: There is a statistically significant difference in veterans' outcomes for overall depression symptoms from pre and post treatment based on veterans' age groups.

Research Question 5: Are there differences in veterans' outcomes for overall anxiety symptoms from pre and post-treatment based on veterans' age groups?

$H0_5$: There is no statistically significant difference in veterans' outcomes for overall anxiety symptoms from pre and post treatment based on veterans' age groups.

HA_5: There is a statistically significant difference in veterans' outcomes for overall anxiety symptoms from pre and post treatment based on veterans' age groups.

Research Question 6: Are there differences in veterans' protective factors scores from pre and post treatment based on veterans' age groups?

$H0_6$: There is no statistically significant difference in veterans' protective factors scores from pre and post treatment based on veterans' age groups.

HA_6: There is a statistically significant difference in veterans' protective factors scores from pre and post treatment based on veterans' age groups.

Research Design and Rationale

A descriptive quantitative retrospective study, utilizing secondary data, was conducted. The rationale for use of this design includes being able to investigate an outcome that has already occurred and identifying potential associations among variables. However, it does not allow the variables to be manipulated (Salkind, 2010). Advantages

of this type of study include a quick and simple analysis procedure, the ability to use already-established databases, and the need for fewer participants than other types of studies. It is also applicable when experimental research has been deemed unethical (Salkind, 2010). For veterans participating in MH RRTP it would be unethical to not provide the treatment they are requesting in order to have a control group that does not receive the intervention. Disadvantages of a retrospective quantitative study include difficulty with risk bias, confounding variables, and lack of control groups. The goal of the study was to determine an overall level of effectiveness of the MH RRTP, following program completion while also determining any differences in outcomes for age groups and lengths of stay in treatment. To achieve this, the most reasonable manner of data analysis was to utilize information that has already been gathered.

Data Analysis

IBM Statistical Package for the Social Sciences (SPSS) was used to analyze all data in this study. Following VA and Walden IRB approval, the Excel spreadsheets containing the data were opened in SPSS, which includes the BAI, BDI-II, and BAM scores from the MCAA data. The scores of all irregular discharges were removed, followed by scores for individuals consecutively attending the co-occurring disorders track and PTSD track (influencing a significant increase in length of stay). Finally, the scores of individuals who did not complete at least one measure (for both pretreatment and discharge) were also removed. This left a total of 1,136 usable cases from the original 2,631 cases. This number exceeded the established minimum sample size necessary.

Prior to conducting the analyses to address the research questions, descriptive statistics were calculated for BDI-II, BAI, and BAM (protective factors) scores from beginning to end of treatment, treatment length of stay, and age groups. The following age groups were created based on participants' reported ages in the dataset: 21-30, 31-40, 41-50, 51-60 and over 60. The length of stay categories included participants who stayed 33 or fewer days, those who stayed 34-46 days, and those who were in programming 47 or more days. Means and standard deviations for pre and post treatment scores were calculated for the BDI-II, BAI, and BAM protective factors scores. Frequencies and percentages were calculated for length of stay categories and age groups.

An internal reliability analysis was conducted for BDI-II, BAI, and BAM (protective factors). Cronbach's alpha coefficients of reliability was calculated for each score to establish internal consistency of each composite score. George and Mallery's (2016) rule of thumb was applied to assess the reliability of each score where coefficients greater than 0.7 indicate acceptable reliability.

Analysis of Variance (ANOVA) tests were conducted to address the research questions. ANOVA provides an accurate method to determine effects of categorical independent variables on one continuous dependent variable, as well as potential interaction effects (Warner, 2013). Specifically, the researcher conducted six one-within one-between, or mixed model, ANOVAs. Mixed model ANOVAs are appropriate when the researcher intends to assess differences in two or more mutually exclusive groups on a continuous dependent variable that has been measured at multiple time points (Tabachnick & Fidell, 2013). The *F* statistic was used to test the presence of differences

in group means for the continuous variables. The test allows for analysis of differences in scores by the main effects of time and group, and the interaction of time and group (Pagano, 2010). The researcher conducted mixed model ANOVAs to assess differences in overall depression symptoms, overall anxiety symptoms, and protective factors from pre to post-intervention by length of stay and age groups.

Prior to conducting the mixed model ANOVA, the researcher assessed the assumptions of the analysis. Assumptions of ANOVA (Warner, 2013) include: the dependent variable contains continuous data, both the within-subjects and between-subjects variables contain at least two categorical related groups, normal distribution of the dependent variable, no significant outliers, independent observations, homogeneity of variances, sphericity, and the variance of the dependent variable is approximately the same in each population. The MH RRTP study design met the ANOVA assumptions.

Finally, post hoc analyses were conducted for statistically significant results, along with post hoc Tukey HSD tests. Tukey's test is used when there are three or more groups being investigated and can assist in decreasing the possibility of a Type I error (Green & Salkind, 2014). Additionally, paired *t*-tests were conducted between each repeated measurement and within each category of length of stay to examine the within-subjects effects. This combination of statistical tests allowed for differences in the BDI-II, BAI, and BAM protective factors scores to be detected accurately.

Limitations

External Validity Limitations

There are general limitations to external validity in this study. This primarily includes the lack of generalizability to the larger population. The results of this study only apply to veterans with co-occurring disorders who participate in residential treatment within the VA system. Since this study used a descriptive quantitative retrospective design, a true cause and effect cannot be established as it was not possible to manipulate the variables in this study. While the study does not allow for overall generalizability to the entire population, it can provide key information about the program effectiveness for the veterans who have participated in the program.

Internal Validity Limitations

There are several internal validity limitations that must be considered for this study. The first is related to fidelity of the interventions. The MH RRTP clinicians are trained to facilitate the core groups of CBT and SCMI in a similar manner with the material being consistent in all groups, but personality and therapeutic styles may impact the outcomes to a certain extent. Additionally, while all veterans in MH RRTP receive the core groups of SCMI and CBT, there are elective groups that some attend, which focus on other areas of concern, such as guilt/shame issues, emotions, and relationships. Therefore, this study was exploratory and focused primarily on the overall outcomes of participating and completing the program with regards to the length of stay and age group variables.

Additional limitations of this exploratory study include the lack of examining long-term treatment outcomes of MH RRTP, instead focusing specifically on treatment impact at program completion. Future studies may investigate outcome differences based on the selection of elective groups, as well as differences among the MH RRTP teams (which are based on diagnosis and severity of symptoms), types of substances abused, outcome differences with genders and ethnicities/races, and long-term effects. Additionally, there is the risk of social desirability bias, a type of response that occurs when participants answer questions on self-report questionnaires in a way that makes them appear to be functioning better (than how they really are doing). However, this often occurs when participants are actively involved in a research study and may be less likely with archival data. It also does not account for individuals who did not complete both the pre and posttest for the depression, anxiety, and substance abuse measures, referred to as attrition bias (Salkind, 2010). It would be beneficial for future studies to examine potential reasons for not completing the posttest questionnaires. Veterans may have preferred not to answer the questions, missed the outcome group (completed close to admission and again at discharge), or left the program due to an irregular discharge. Investigating the reasons behind irregular discharges may also provide useful information.

Finally, a limitation that should be considered relates to the potential of depression symptoms decreasing due to duration of sustained abstinence during residential treatment. This has been studied in previous research, including via a meta-analysis of 22 studies from 1980 to 2014 (Foulds, Adamson, Boden, Williman, &

Mulder, 2015). While there is sometimes an increase in depression symptoms during early withdrawal, this meta-analysis demonstrated that there may be a correlation between symptoms and duration of sobriety, often during the first three to six weeks of treatment (Foulds et al., 2015).

Summary

The descriptive quantitative retrospective design allowed for an exploratory study of the effectiveness of the MH RRTP at the Saint Cloud VA. In completing this study, additional information is available regarding the impact of this treatment on veterans who have mental health and/or substance abuse (co-occurring) disorders, while specifically investigating potential differences in length of stay and age variables. This information will be used for program improvement and pave the way for further studies to be completed, such as the impact of specific groups or interventions, in addition to the overall program effectiveness, and investigating long-term outcomes for MH RRTP.

Chapter 4: Results

Introduction

Through this descriptive quantitative retrospective study, I sought to examine whether participation in the MH RRTP at the Saint Cloud VA impacted a decrease in depression and anxiety while improving protective factors for recovery for individuals who participated in 2016 and 2017. The specific variables of age and length of stay were studied via archival data. Veterans completed the BDI-II, BAI, and BAM at the start and end of treatment to measure the impact of the MH RRTP service delivery model. This information may be useful for staff of the program and other VA residential facilities to consider in program development.

Prior to completing the ANOVAs, Cronbach's alpha coefficients were calculated for the BAI, BDI-II, and BAM using the guidelines suggested by George and Mallery (2016), which specify > .9 excellent, > .8 good, > .7 acceptable, > .6 questionable, > .5 poor, and ≤ .5 unacceptable. The full datasets for the 2016 data were available and were used to determine Cronbach's alpha coefficients. Unfortunately, the 2017 data only included final scores (rather than individual items), including a tally for the protective factors, BDI-II, and BAI. In the 2016 data, the items for the admission BAI had a Cronbach's alpha coefficient of 0.93, indicating excellent reliability. The items for the admission BDI-II had a Cronbach's alpha coefficient of 0.92, also indicating excellent reliability. The items for the admission BAM had a Cronbach's alpha coefficient of 0.74, indicating acceptable reliability. For the discharge BAI, the Cronbach's alpha coefficient was 0.94, indicating excellent reliability. The items for the discharge BDI-II had a

Cronbach's alpha coefficient of 0.92, indicating excellent reliability. The items for the discharge BAM had a Cronbach's alpha coefficient of 0.44, indicating unacceptable reliability.

A descriptive quantitative retrospective study was chosen because it allowed for an understanding of differences in BDI-II, BAI, and BAM protective factors scores from the start to completion of treatment by using archival data. This chapter addresses the results from the six research questions and analyses that were conducted. The research questions and hypotheses, which are addressed individually, were as follows:

Research Question 1: Are there differences in veterans' outcomes for overall depression symptoms from pre and post treatment based on length of stay (33 or fewer days, 34-46 days, and 47 or more days) in MH RRTP?

$H0_1$: There is no statistically significant difference in veterans' outcomes for overall depression symptoms from the start of treatment to completion based on length of stay (33 or fewer days, 34-46 days, and 47 or more days) in MH RRTP.

HA_1: There is a statistically significant difference in veterans' outcomes for overall depression symptoms from the start of treatment to completion based on length of stay (33 or fewer days, 34-46 days, and 47 or more days) in MH RRTP.

Research Question 2: Are there differences in veterans' outcomes for overall anxiety symptoms from pre and post treatment based on length of stay (33 or fewer days, 34-46 days, and 47 or more days) in MH RRTP?

$H0_2$: There is no statistically significant difference in veterans' outcomes for overall anxiety symptoms from the start of treatment to completion based on length of stay (33 or fewer days, 34-46 days, and 47 or more days) in MH RRTP.

HA_2: There is a statistically significant difference in veterans' outcomes for overall anxiety symptoms from the start of treatment to completion based on length of stay (33 or fewer days, 34-46 days, and 47 or more days) in MH RRTP.

Research Question 3: Are there differences in veterans' protective factors scores from pre and post treatment based on veterans' length of stay?

$H0_3$: There is no statistically significant difference in veterans' protective factors scores from pre and post treatment based on veterans' length of stay.

HA_3: There is a statistically significant difference in veterans' protective factors scores from pre and post treatment based on veterans' length of stay.

Research Question 4: Are there differences in veterans' outcomes for overall depression symptoms from pre and post treatment based on veterans' age groups?

$H0_4$: There is no statistically significant difference in veterans' outcomes for overall depression symptoms from pre and post treatment based on veterans' age groups.

HA_4: There is a statistically significant difference in veterans' outcomes for overall depression symptoms from pre and post treatment based on veterans' age groups.

Research Question 5: Are there differences in veterans' outcomes for overall anxiety symptoms from pre and post treatment based on veterans' age groups?

$H0_5$: There is no statistically significant difference in veterans' outcomes for overall anxiety symptoms from pre and post treatment based on veterans' age groups.

HA_5: There is a statistically significant difference in veterans' outcomes for overall anxiety symptoms from pre and post treatment based on veterans' age groups.

Research Question 6: Are there differences in veterans' protective factors scores from pre and post treatment based on veterans' age groups?

$H0_6$: There is no statistically significant difference in veterans' protective factors scores from pre and post treatment based on veterans' age groups.

HA_6: There is a statistically significant difference in veterans' protective factors scores from pre and post treatment based on veterans' age groups.

Descriptive Data

The veterans in this study were admitted to the MH RRTP between January 1, 2016 and December 31, 2017 and completed the program successfully. The number of participants was reduced to 1,136 from an original group of 2,631 veterans after eliminating those who discharged with irregular status (prior to their agreed-upon

completion date) or participated in concurrent treatment episodes of care (transferring directly from the co-occurring disorders track to the PTSD track). The length of stay groups were divided into three categories: 33 or fewer days (Group 1), 34-46 days (Group 2), and 47 or more days (Group 3). The age groups were divided into five categories: 21-30 (Group 1), 31-40 (Group 2), 41-50 (Group 3), 51-60 (Group 4), and 61 and over (Group 5). Summary statistics were calculated for each interval and ratio variable. Frequencies and percentages were calculated for each nominal variable. The most frequently observed category for the number of days in programming was 34-46 days (n = 433, 38%). The most frequently observed category for age groups was ages 51-60 (n = 363, 32%). Frequencies and percentages for length of stay and age group are presented in Table 1.

Table 1

|*Frequencies and Percentages for Length of Stay and Age Groups*

Variable	*n*	*%*
Length of stay		
1 (33 days or fewer)	352	30.99
2 (34-46 days)	433	38.12
3 (47 or more days)	351	30.90
Age groups		
1 (21-30)	122	10.74
2 (31-40)	241	21.21
3 (41-50)	191	16.81
4 (51-60)	363	31.95
5 (61 and over)	219	19.28

Note. Due to rounding errors, percentages may not equal 100%.

Minimal range scores on the admission measurements for the BDI-II (0-13) and BAI (0-9) were excluded to allow for a more accurate measure of symptom improvement

among veterans with depression and anxiety. After removing the minimal range scores, the average depression score (BDI-II) at admission was 23.58 (*SD* = 13.30) and at discharge was 12.62 (*SD* = 11.72). The average anxiety score (BAI) at admission was 16.21 (*SD* = 11.90) and at discharge was 10.45 (*SD* = 10.21). The average protective factors (from the BAM) score at admission was 11.98 (*SD* = 4.08) and at discharge was 13.18 (*SD* = 4.16). Skewness and kurtosis were also calculated, and it was noted that none of the skewness and kurtosis values exceeded the critical values. Table 2 presents the summary statistics table means, standard deviations, and number of participants for the admission and discharge scores.

Table 2

Summary Statistics Table for Interval and Ratio Variables

Variable	*M*	*SD*	*n*
Admission depression scores	23.58	13.30	1,055
Admission anxiety scores	16.21	11.90	1,054
Admission protective factors scores	11.98	4.08	979
Discharge depression scores	12.62	11.72	1,093
Discharge anxiety scores	10.45	10.21	1,098
Discharge protective factors scores	13.18	4.16	966

Results of the Study

Each research question and corresponding hypotheses are addressed in this section. A total of six one-within one-between, or mixed model, ANOVAs were conducted. For each ANOVA, the assumptions of univariate normality,

homoscedasticity, outliers, and sphericity were assessed. However, the usual sphericity assumption does not apply when there are only two repeated measurements. Additionally, normality was evaluated for each ANOVA using a Q-Q scatterplot (Bates, Mächler, Bolker, & Walker, 2014; DeCarlo, 1997; Field, 2009). This method compares the distribution of the residuals with a normal distribution (a theoretical distribution that follows a bell curve). A fairly normal distribution is indicated with a straight, solid line. For each test, Mahalanobis distances were calculated on the residuals and compared to a χ^2 distribution (Newton & Rudestam, 2012) to identify influential points. An outlier was defined as any Mahalanobis distance that exceeded 10.83, the .999 quantile of a χ^2 distribution with 1 degree of freedom. Outliers in the data that met these criteria were subsequently removed from the analysis. Additionally, post-hoc analyses were completed for results that indicated potential significance in scores on the BDI-II, BAI, and/or BAM from admission to discharge.

Results for Research Question 1

Research Question 1: Are there differences in veterans' outcomes for overall depression symptoms from pre and post treatment based on length of stay (33 or fewer days, 34-46 days, and 47 or more days) in MH RRTP?

$H0_1$: There is no statistically significant difference in veterans' outcomes for overall depression symptoms from the start of treatment to completion based on length of stay (33 or fewer days, 34-46 days, and 47 or more days) in MH RRTP.

HA_1: There is a statistically significant difference in veterans' outcomes for overall depression symptoms from the start of treatment to completion based on length of stay (33 or fewer days, 34-46 days, and 47 or more days) in MH RRTP.

Analysis for Depression and Length of Stay

A mixed model analysis of variance (ANOVA) with one within-subjects factor and one between-subjects factor was conducted to determine whether significant differences existed in pretreatment depression scores and discharge depression scores using the BDI-II between the levels of length of stay. Prior to the analysis, the assumptions of univariate normality, homoscedasticity, and absence of outliers were assessed. The assumption of normality was evaluated using a Q-Q scatterplot (Bates et al., 2014; DeCarlo, 1997; Field, 2009) and was met as indicated by the Q-Q scatterplot as presented in Figure 1. The assumption of homoscedasticity was met as demonstrated by the scatterplot in Figure 2. Two outliers were removed from this test using the Mahalanobis distances calculation.

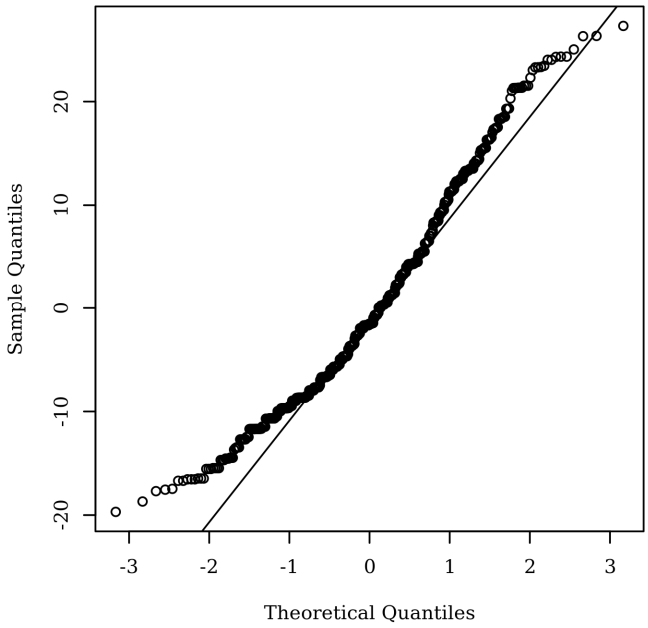

Figure 1. Q-Q scatterplot testing normality.

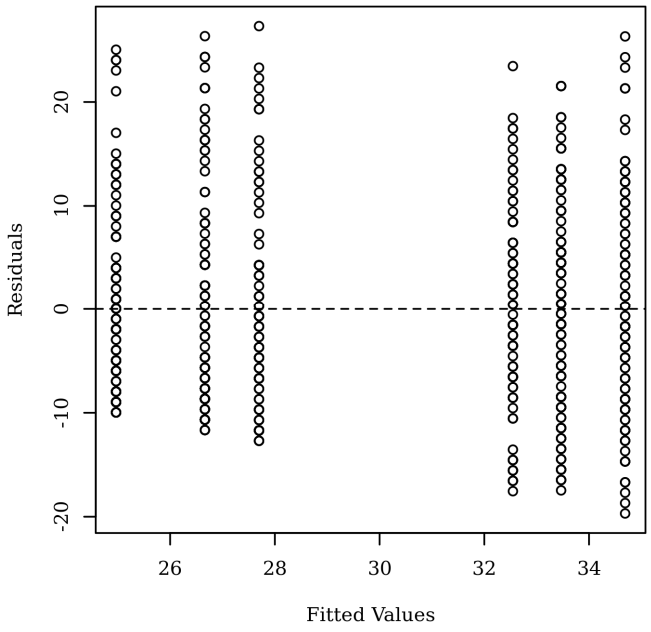

Figure 2. Residuals scatterplot testing homoscedasticity.

Results for Depression and Length of Stay

The main effect for length of stay was not significant $F(2, 321) = 0.91$, $p = .404$, indicating that the depression scores were similar across categories of length of stay. The main effect for the within-subjects factor was significant, $F(1, 321) = 169.14$, $p < .001$, indicating that there were significant differences between the values of admission depression scores and discharge depression scores on the BDI-II. The interaction effect between the within-subjects factor and length of stay was significant $F(2, 321) = 3.96$, $p = .020$, indicating differences in depression scores from admission to discharge by length of stay categories. Due to this significant interaction effect, the null hypothesis was rejected for Research Question 1. Table 3 presents the ANOVA results, Table 4 presents means and standard deviations for each factor level combination and row and column totals, and Figure 3 displays the depression admission and discharge score means by length of stay.

Table 3

ANOVA Results for Depression and Length of Stay

Source	*SS*	*df*	*MS*	*F*	*p*	η_p^2
Between-subjects						
Length of stay	258.06	2	129.03	0.91	.404	0.01
Residuals	45511.18	321	141.78			
Within-subjects						
Within factor	8030.81	1	8030.81	169.14	< .001	0.35
Length of stay: Within	376.15	2	188.07	3.96	.020	0.02
Residuals	15241.23	321	47.48			

Table 4

Means and Standard Deviations for Length of Stay and Depression Scores

	Admission depression scores	Discharge depression scores	Row average
Length of stay	*M (SD)*	*M (SD)*	*M (SD)*
≤ 33 days (Group 1)	32.55 (9.55)	27.70 (9.90)	30.12 (9.99)
34-46 days (Group 2)	33.47 (10.06)	24.97 (8.44)	29.22 (10.20)
≥ 47 days (Group 3)	34.69 (10.21)	26.66 (10.14)	30.68 (10.92)
Column average	33.66 (9.99)	26.30 (9.50)	29.98 (10.41)

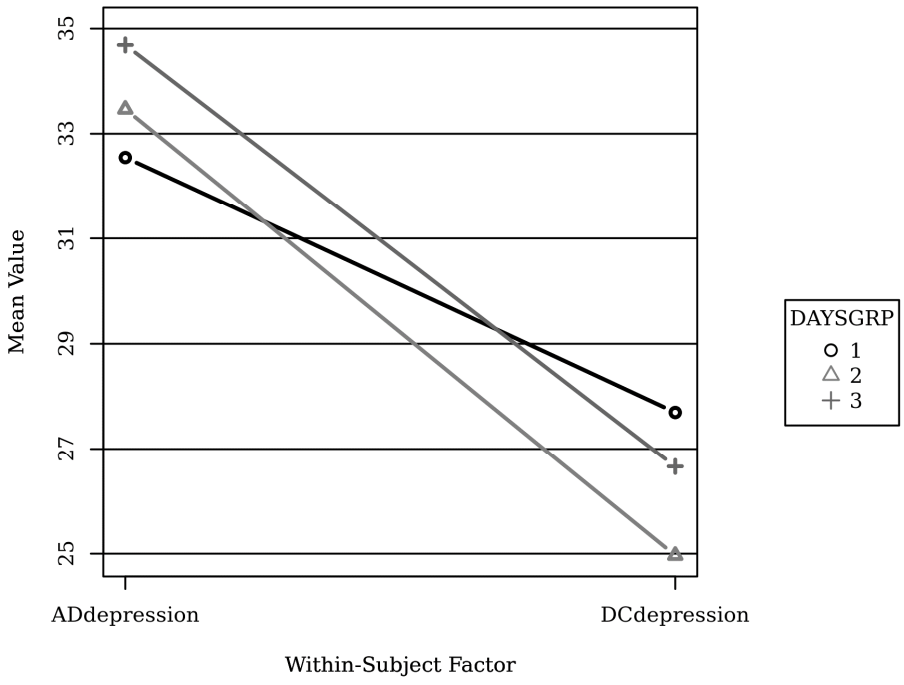

Figure 3. Depression admission and discharge means by length of stay.

Post-Hoc Tests for Depression and Length of Stay

Post-hoc tests were conducted to further explore the significant effects; paired *t*-tests were conducted between each repeated measurement and within each category of length of stay group to examine the within-subjects effects. The overall mean for admission depression was significantly larger than for the posttest depression scores, $t = 13.47$, $p < .001$. For all length of stay groups, the admission scores were significantly larger at admission than at discharge on the BDI-II, with the first group (shortest length of stay), $t = 4.83$, $p < .001$, the second group (moderate length of stay), $t = 10.12$, $p < .001$ and the longest length of stay, $t = 8.23$, $p < .001$. To determine between-subject effects, Tukey comparisons were conducted for each repeated measurement using length of stay as the independent variable to examine the between-subjects effects with no further significant differences found.

Results for Research Question 2

Research Question 2: Are there differences in veterans' outcomes for overall anxiety symptoms from pre and post treatment based on length of stay (33 or less days, 34-46 days, and 47 or more days) in MH RRTP?

$H0_2$: There is no statistically significant difference in veterans' outcomes for overall anxiety symptoms from the start of treatment to completion based on length of stay (33 or less days, 34-46 days, and 47 or more days) in MH RRTP.

HA_2: There is a statistically significant difference in veterans' outcomes for overall anxiety symptoms from the start of treatment to completion based

on length of stay (33 or less days, 34-46 days, and 47 or more days) in MH RRTP.

Analysis for Anxiety and Length of Stay

A mixed model analysis of variance (ANOVA) with one within-subjects factor and one between-subjects factor was conducted to determine whether significant differences exist in admission and discharge anxiety scores on the BAI between the levels of length of stay. Prior to the analysis, the assumptions of univariate normality, homoscedasticity, and absence of outliers were assessed. The assumption of normality was evaluated using a Q-Q scatterplot (Bates et al., 2014; DeCarlo, 1997; Field, 2009) and was met as indicated by the Q-Q scatterplot as presented in Figure 4. The assumption of homoscedasticity was met as demonstrated by the scatterplot in Figure 5. Five outliers were removed from this test using the Mahalanobis distances calculation.

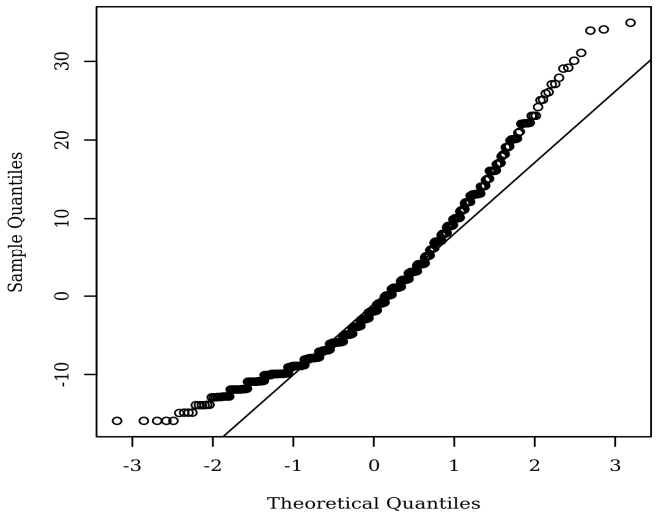

Figure 4. Q-Q scatterplot testing normality.

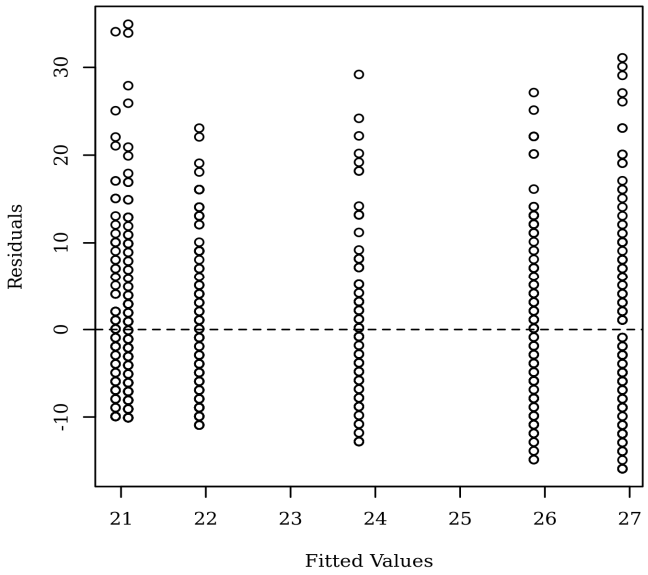

Figure 5. Residuals scatterplot testing homoscedasticity.

Results for Anxiety and Length of Stay

The main effect for length of stay was not significant $F(2, 349) = 1.67$, $p = .190$, indicating the values of length of stay were all similar. The main effect for the within-subjects factor was significant $F(1, 349) = 65.34$, $p < .001$, indicating there were significant differences between the values of admission anxiety scores and discharge anxiety scores. The interaction effect between the within-subjects factor and length of stay was not significant $F(2, 349) = 1.50$, $p = .224$, indicating similar values for admission anxiety scores, discharge anxiety scores, and levels of length of stay. Due to no interaction effect being present, the null hypothesis was not rejected for Research Question 2. Table 5 presents the ANOVA results, Table 6 presents means and standard deviations for each factor level combination and row and column totals, and Figure 6 presents a graph of the admission and discharge anxiety score means by length of stay.

Table 5

ANOVA Results for Anxiety and Length of Stay

Source	*SS*	*df*	*MS*	*F*	*p*	η_p^2
Between-subjects						
Length of stay	454.32	2	227.16	1.67	.190	0.01
Residuals	47439.56	349	135.93			
Within-subjects						
Within factor	3053.17	1	3053.17	65.34	< .001	0.16
Length of stay: Within factor	140.60	2	70.30	1.50	.224	0.01
Residuals	16306.71	349	46.72			

Table 6

Means and Standard Deviations for Length of Stay and Anxiety Scores

	Admission anxiety scores	Discharge anxiety scores	Row average
Length of stay	*M (SD)*	*M (SD)*	*M (SD)*
≤ 33 days (Group 1)	23.81 (9.15)	20.94 (8.94)	22.37 (9.14)
34-46 days (Group 2)	25.87 (9.59)	21.08 (9.39)	23.48 (9.77)
≥ 47 days (Group 3)	26.91 (11.28)	21.92 (8.46)	24.42 (10.26)
Column average	25.71 (10.18)	21.35 (8.93)	23.53 (9.81)

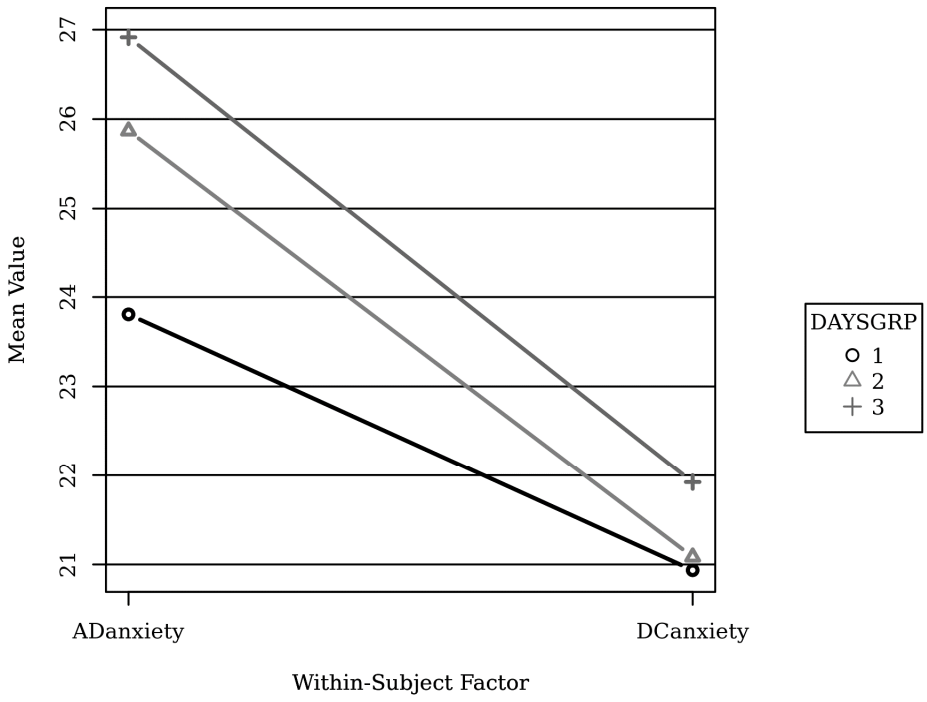

Figure 6. Admission and discharge anxiety means by length of stay.

Results for Research Question 3

Research Question 3: Are there differences in veterans' protective factors scores from pre and post treatment based on veterans' length of stay?

$H0_3$: There is no statistically significant difference in veterans' protective factors scores from pre and post treatment based on veterans' length of stay.

HA_3: There is a statistically significant difference in veterans' protective factors scores from pre and post treatment based on veterans' length of stay.

Analysis for Protective Factors and Length of Stay

A mixed model analysis of variance (ANOVA) with one within-subjects factor and one between-subjects factor was conducted to determine whether significant differences exist in admission protective factors scores and discharge protective factors scores between the levels of lengths of stay. Prior to the analysis, the assumptions of univariate normality, homoscedasticity, and absence of outliers were assessed. Normality was evaluated using a Q-Q scatterplot (Bates et al., 2014; DeCarlo, 1997; Field, 2009). The plot indicated that the assumption was met and is presented in Figure 7. Homoscedasticity was evaluated by plotting the residuals against the predicted values. The plot indicated that the assumption was met and is presented in Figure 8. Five outliers were removed from this test using the Mahalanobis distances calculation.

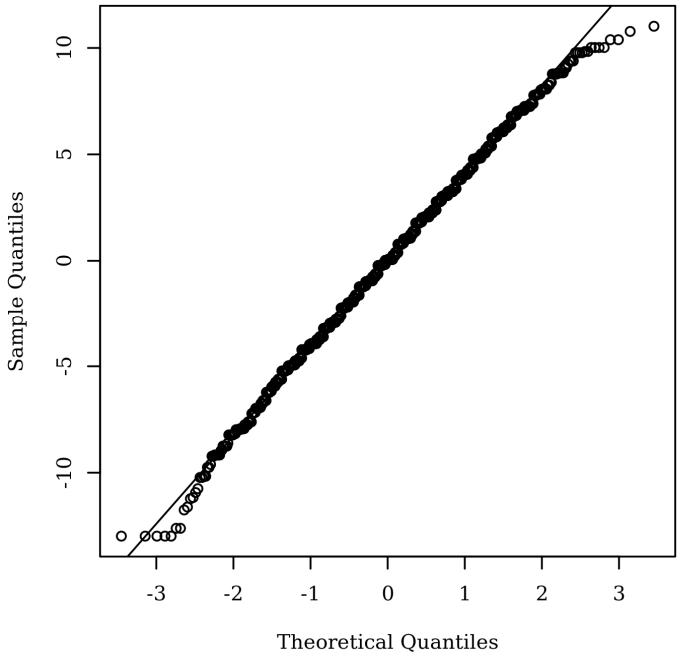

Figure 7. Q-Q scatterplot testing normality.

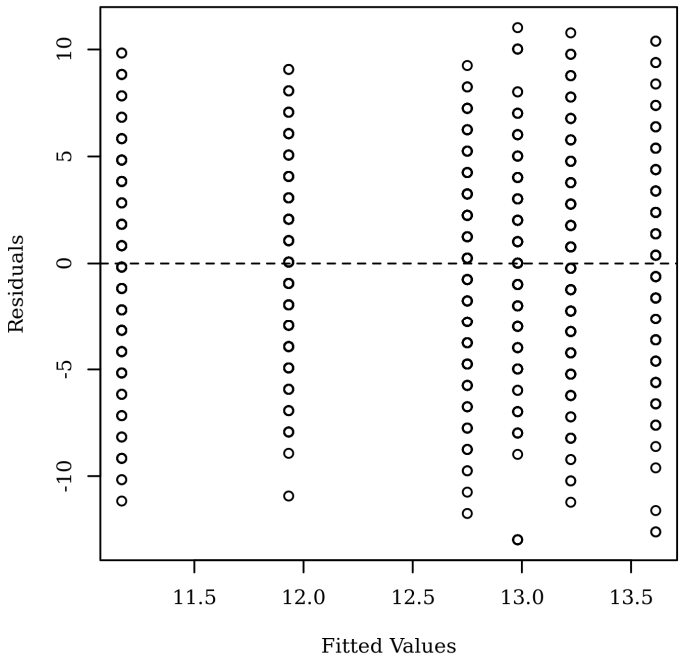

Figure 8. Residuals scatterplot testing homoscedasticity.

Results for Protective Factors and Length of Stay

The main effect for length of stay was significant $F(2, 899) = 7.28$, $p < .001$, indicating there were significant differences among the values of length of stay. The main effect for the within-subjects factor was significant $F(1, 899) = 77.93$, $p < .001$, indicating there were significant differences between the values of admission protective factors scores and discharge protective factors scores. Additionally, the interaction effect for the within-subjects factor and length of stay was significant $F(2, 899) = 3.10$, $p = .045$, indicating differences among the values of admission protective factors scores, discharge protective factors scores, and levels of length of stay. As there was an interaction effect noted ($p = .045$), the null hypothesis for research question 3 was rejected. Table 7 presents the ANOVA results. Table 8 presents means and standard

deviations for each factor level combination and row and column totals. Figure 9 displays the admission and discharge protective factor means by length of stay.

Table 7

ANOVA Results for Protective Factors and Length of Stay

Source	*SS*	*df*	*MS*	*F*	*p*	η_p^2
Between-subjects						
Length of stay	338.48	2	169.24	7.28	< .001	0.02
Residuals	20911.17	899	23.26			
Within-subjects						
Within factor	775.74	1	775.74	77.93	< .001	0.08
Length of stay: Within factor	61.74	2	30.87	3.10	.045	0.01
Residuals	8949.25	899	9.95			

Table 8

Means and Standard Deviations for Protective Factors and Length of Stay

	Admission protective factors scores	Discharge protective factors scores	Row average
Length of stay	*M (SD)*	*M (SD)*	*M (SD)*
≤ 33 days (Group 1)	12.75 (4.18)	13.61 (4.16)	13.18 (4.19)
34-46 days (Group 2)	11.93 (3.70)	13.22 (4.00)	12.58 (3.90)
≥ 47 days (Group 3)	11.17 (4.26)	12.98 (4.26)	12.07 (4.35)
Column average	11.98 (4.07)	13.28 (4.13)	12.63 (4.15)

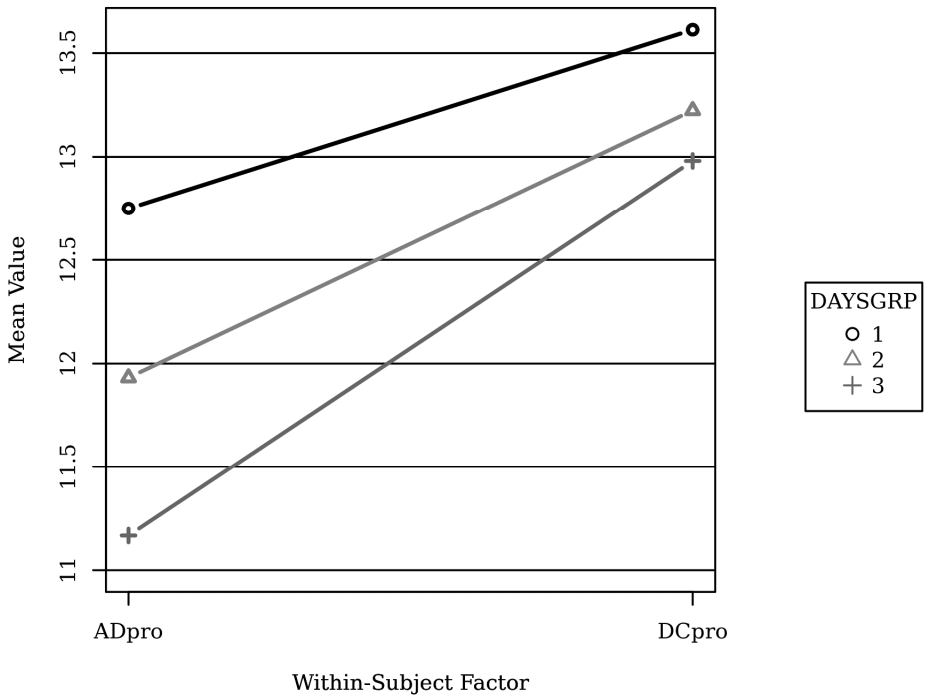

Figure 9. Protective factor means by length of stay.

Post-Hoc Tests for Protective Factors and Length of Stay

Post-hoc tests were conducted to further explore the significant effects. Paired *t*-tests were conducted between each repeated measurement and within each category of length of stay to examine the within-subjects effects. Overall admission protective factors scores were significantly smaller than discharge protective factors scores, $t = -8.74$, $p < .001$. For the specific lengths of stay results, Group 1 (shortest length of stay) admission protective factors scores were significantly smaller than discharge protective factors scores, $t = -3.27$, $p = .001$. For the moderate length of stay (Group 2), admission scores were also significantly smaller than discharge scores, $t = -5.64$, $p < .001$ and for the longest length of stay (Group 3), admission scores were significantly smaller than

discharge scores, $t = -6.29$, $p < .001$. Tukey comparisons were conducted for each repeated measurement using length of stay as the independent variable to examine the between-subjects effects. For the admission protective factors scores, the mean for Group 2 was significantly smaller than Group 1, $p = .028$ and the mean of the admission protective factors scores for Group 3 was significantly smaller than group 1, $p < .001$.

Results for Research Question 4

Research Question 4: Are there differences in veterans' outcomes for overall depression symptoms from pre and post treatment based on veterans' age groups?

$H0_4$: There is no statistically significant difference in veterans' outcomes for overall depression symptoms from pre and post treatment based on veterans' age groups.

HA_4: There is a statistically significant difference in veterans' outcomes for overall depression symptoms from pre and post treatment based on veterans' age groups.

Analysis for Depression and Age Groups

A mixed model analysis of variance (ANOVA) with one within-subjects factor and one between-subjects factor was conducted to determine whether significant differences exist in admission depression scores and discharge depression scores between the levels of age groups. Prior to the analysis, the assumptions of univariate normality, homoscedasticity, and absence of outliers were assessed. Normality was evaluated using a Q-Q scatterplot (Bates et al., 2014; DeCarlo, 1997; Field, 2009). The plot indicated that the assumption was met and is presented in Figure 10. Homoscedasticity was evaluated

by plotting the residuals against the predicted values. The plot indicated that the assumption was met and is presented in Figure 11. Three outliers were removed from this test using the Mahalanobis distances calculation.

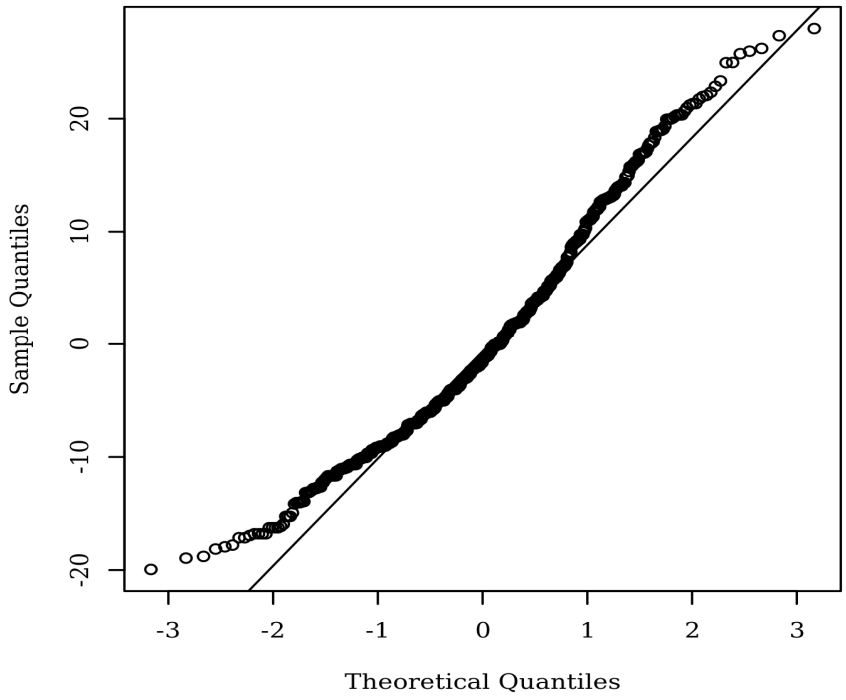

Figure 10. Q-Q scatterplot testing normality.

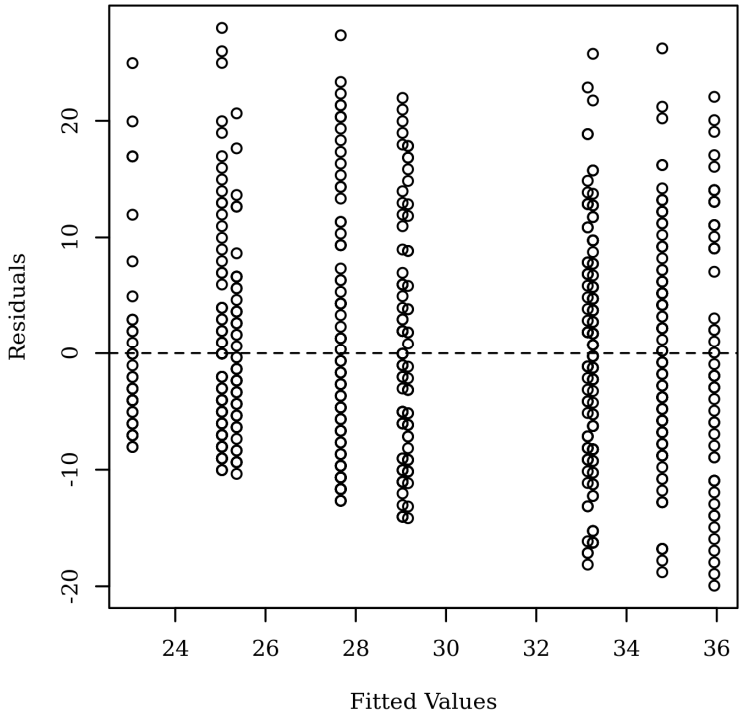

Figure 11. Residuals scatterplot testing homoscedasticity.

Results for Age Groups and Depression

The main effect for age groups was significant $F(4, 319) = 4.21$, $p = .002$, indicating there were significant differences among the values of age groups. The main effect for the within-subjects factor was significant $F(1, 319) = 154.26$, $p < .001$, indicating there were significant differences between the values of admission depression scores and discharge depression scores. The interaction effect between the within-subjects factor and age groups was not significant $F(4, 319) = 0.38$, $p = .822$, indicating similar values for admission depression scores, discharge depression scores, and levels of age groups. Due to an interaction effect that was not statistically significant ($p = .822$), the null hypothesis was not rejected for Research Question 4. Table 9 presents the

ANOVA results. Table 10 presents means and standard deviations for each factor level combination and row and column totals. Figure 12 displays the depression admission and discharge means by age groups.

Table 9

ANOVA Results for Depression and Age Groups

Source	*SS*	*df*	*MS*	*F*	*p*	η_p^2
Between-subjects						
Age groups	2294.56	4	573.64	4.21	.002	0.05
Residuals	43474.68	319	136.28			
Within-subjects						
Within Factor	7516.20	1	7516.20	154.26	< .001	0.33
Age groups: Within factor	74.38	4	18.59	0.38	.822	0.00
Residuals	15543.00	319	48.72			

Table 10

Means and Standard Deviations for Depression Scores and Age Groups

	Admission depression scores	Discharge depression scores	Row average
Age groups	*M (SD)*	*M (SD)*	*M (SD)*
1 (Ages 21-30)	33.14 (10.28)	25.36 (7.26)	29.25 (9.67)
2 (Ages 31-40)	34.79 (9.37)	27.67 (10.72)	31.23 (10.65)
3 (Ages 41-50)	35.94 (11.50)	29.04 (9.74)	32.49 (11.16)
4 (Ages 51-60)	33.26 (8.97)	25.03 (9.06)	29.15 (9.89)
5 (Ages 61+)	29.16 (9.92)	23.05 (8.24)	26.11 (9.56)
Column average	33.66 (9.99)	26.30 (9.50)	29.98 (10.41)

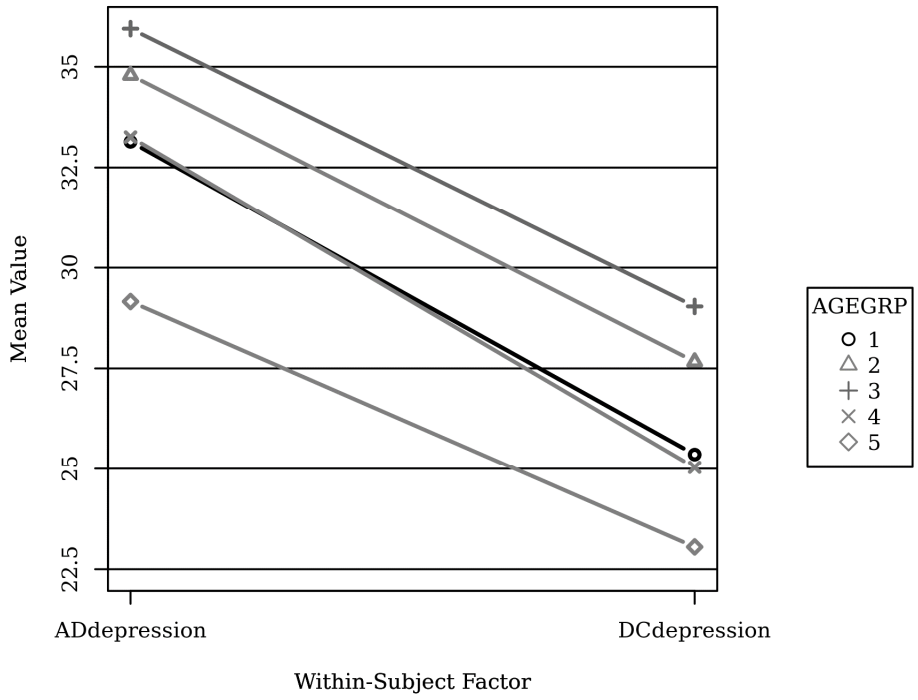

Figure 12. Depression means by age groups.

Results for Research Question 5

Research Question 5: Are there differences in veterans' outcomes for overall anxiety symptoms from pre and post treatment based on veterans' age groups?

$H0_5$: There is no statistically significant difference in veterans' outcomes for overall anxiety symptoms from pre and post treatment based on veterans' age groups.

HA_5: There is a statistically significant difference in veterans' outcomes for overall anxiety symptoms from pre and post treatment based on veterans' age groups.

Analysis for Anxiety and Age Groups

A mixed model ANOVA with one within-subjects factor and one between-subjects factor was conducted to determine whether significant differences exist in admission anxiety scores and discharge anxiety scores between the levels of age groups. Prior to the analysis, the assumptions of univariate normality, homoscedasticity, and absence of outliers were assessed. Normality was evaluated using a Q-Q scatterplot (Bates et al., 2014; DeCarlo, 1997; Field, 2009). The plot indicated that the assumption was met and is presented in Figure 13. Homoscedasticity was evaluated by plotting the residuals against the predicted values. The assumption was met and is presented in Figure 14. Five outliers were removed from this test using the Mahalanobis distances calculation.

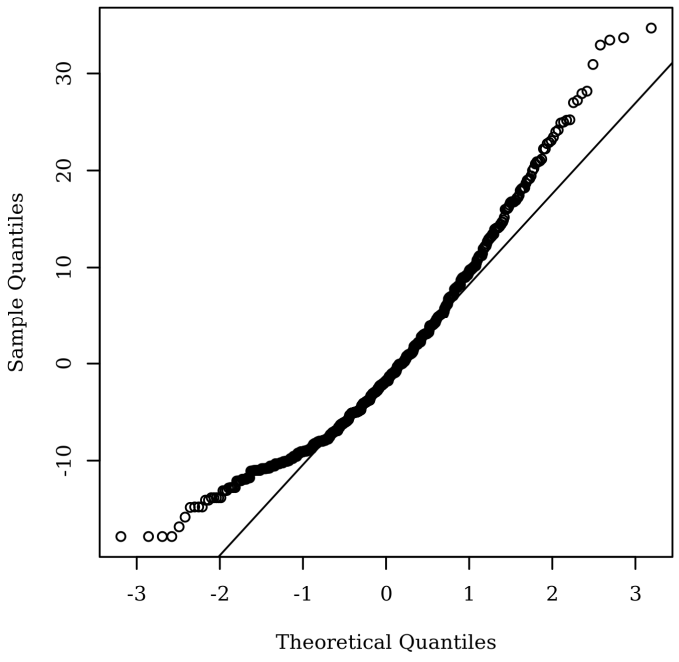

Figure 13. Q-Q scatterplot testing normality.

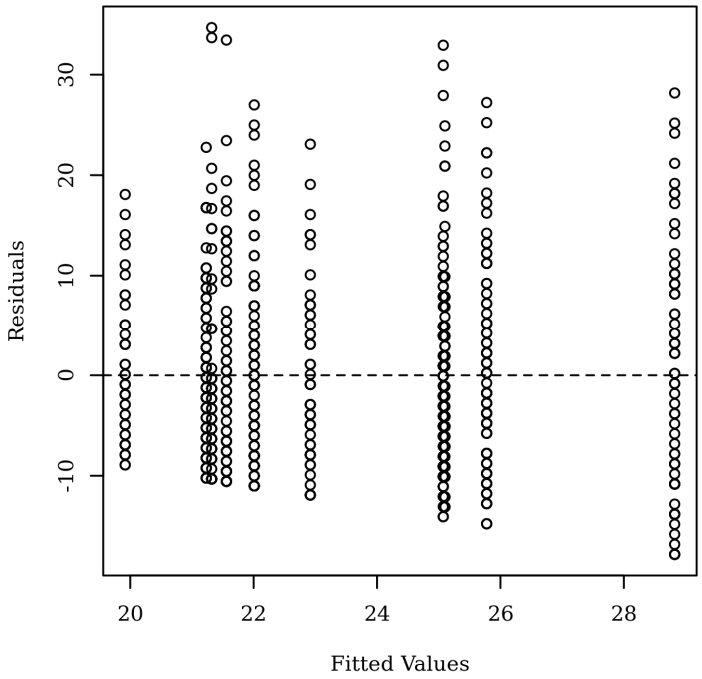

Figure 14. Residuals scatterplot testing homoscedasticity.

Results for Age Groups and Anxiety

The main effect for age groups was not significant $F(4, 347) = 1.61$, $p = .171$, indicating the values of age groups were all similar. The main effect for the within-subjects factor was significant $F(1, 347) = 65.69$, $p < .001$, indicating there were significant differences between the values of admission anxiety scores and discharge anxiety scores. The interaction effect between the within-subjects factor and age groups was not significant $F(4, 347) = 1.99$, $p = .095$, indicating similar values for admission anxiety scores, discharge anxiety scores, and levels of age groups. For Research Question 5, the null hypothesis was not rejected because the interaction effect was not statistically significant ($p = .095$). Table 11 presents the ANOVA results. Table 12 presents means

and standard deviations for each factor level combination and row and column totals.

Figure 15 displays admission and discharge anxiety means by age groups.

Table 11

ANOVA Results for Anxiety and Age Groups

Source	*SS*	*df*	*MS*	*F*	*p*	η_p^2
Between-subjects						
Age groups	873.07	4	218.27	1.61	.171	0.02
Residuals	47020.81	347	135.51			
Within-subjects						
Within factor	3043.83	1	3043.83	65.69	< .001	0.16
Age groups: Within factor	369.72	4	92.43	1.99	.095	0.02
Residuals	16077.58	347	46.33			

Table 12

Means and Standard Deviations for Anxiety and Age Groups

	Admission anxiety scores	Discharge anxiety scores	Row average
Age groups	*M (SD)*	*M (SD)*	*M (SD)*
1	25.10 (9.46)	21.32 (10.82)	23.21 (10.29)
2	25.78 (9.61)	22.01 (8.98)	23.89 (9.47)
3	28.82 (12.14)	21.56 (9.88)	25.19 (11.62)
4	25.07 (9.89)	21.23 (7.80)	23.15 (9.09)
5	22.92 (8.75)	19.92 (7.03)	21.42 (8.04)
Column average	25.71 (10.18)	21.35 (8.93)	23.53 (9.81)

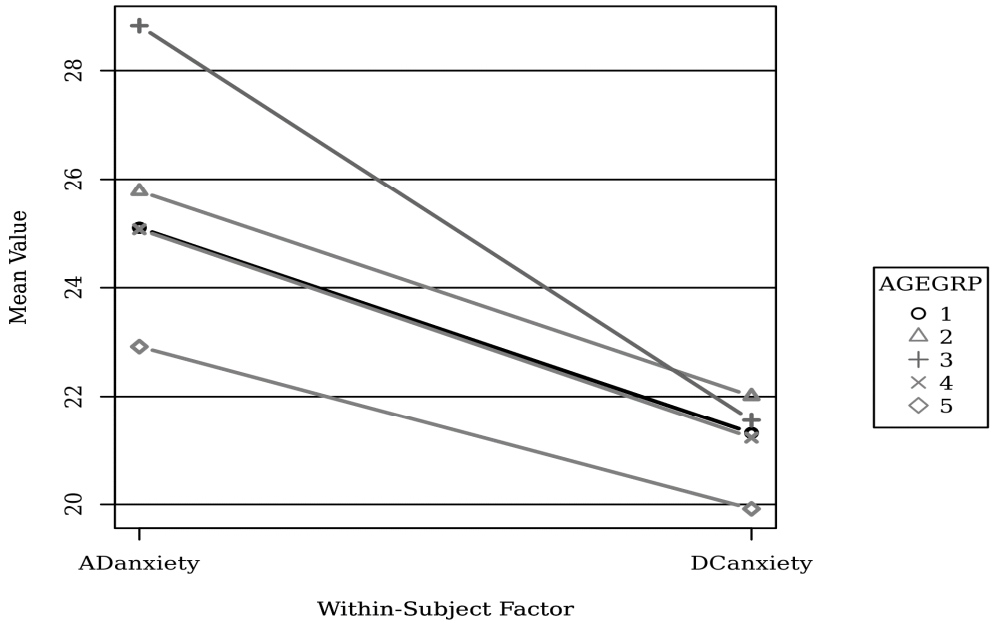

Figure 15. Anxiety means by age groups.

Results for Research Question 6

Research Question 6: Are there differences in veterans' protective factors scores from pre and post treatment based on veterans' age groups?

$H0_6$: There is no statistically significant difference in veterans' protective factors scores from pre and post treatment based on veterans' age groups.

HA_6: There is a statistically significant difference in veterans' protective factors scores from pre and post treatment based on veterans' age groups.

Analysis for Protective Factors and Age Groups

A mixed model ANOVA with one within-subjects factor and one between-subjects factor was conducted to determine whether significant differences exist in admission protective factors scores and discharge protective factors scores between the

levels of age groups. Prior to the analysis, the assumptions of univariate normality, homoscedasticity, and absence of outliers were assessed. Normality was evaluated using a Q-Q scatterplot (Bates et al., 2014; DeCarlo, 1997; Field, 2009). The plot indicated that the assumption was met and is presented in Figure 16. Homoscedasticity was evaluated by plotting the residuals against the predicted values. The assumption was met and is presented in Figure 17. Five outliers were removed from this test using the Mahalanobis distances calculation.

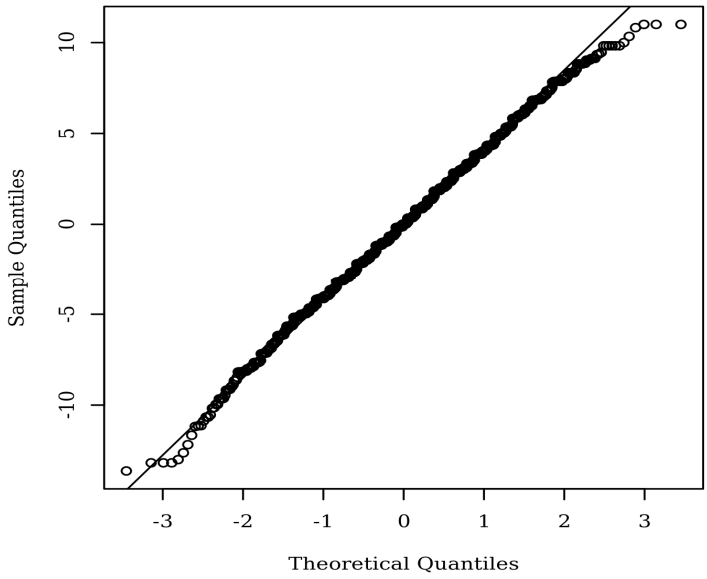

Figure 16. Q-Q scatterplot testing normality.

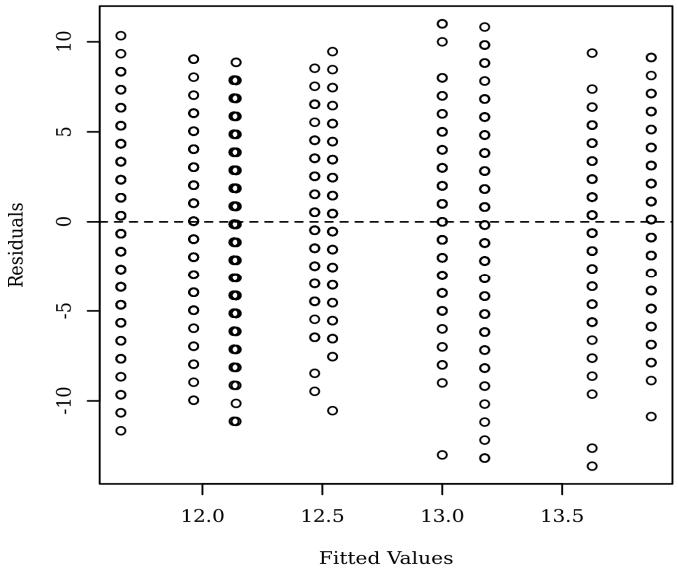

Figure 17. Residuals scatterplot testing homoscedasticity.

Results for Age Groups and Protective Factors

The main effect for age groups was not significant $F(4, 897) = 1.11$, $p = .350$, indicating the values of age groups were similar. The main effect for the within-subjects factor was significant $F(1, 897) = 54.40$, $p < .001$, indicating significant differences between the values of admission and discharge protective factors scores. The interaction effect between the within-subjects factor and age groups was significant $F(4, 897) = 2.59$, $p = .036$, indicating differences among the values of admission protective factors scores, discharge protective factors scores, and levels of age groups. For Research Question 6, the null hypothesis was rejected due to the interaction effect being statistically significant. Table 13 presents the ANOVA results. Table 14 presents means and standard deviations for each factor level combination and row and column totals. Figure 18 displays a graph of admission and discharge protective factors means by age groups.

Table 13

ANOVA Results for Protective Factors and Age Groups

Source	*SS*	*df*	*MS*	*F*	*p*	η_p^2
Between-subjects						
Age groups	104.71	4	26.18	1.11	.350	0.00
Residuals	21144.93	897	23.57			
Within-subjects						
Within factor	540.22	1	540.22	54.40	< .001	0.06
Age groups: Within factor	102.86	4	25.72	2.59	.036	0.01
Residuals	8908.13	897	9.93			

Table 14

Means and Standard Deviations for Protective Factors and Age Groups

	Admission protective factors scores	Discharge protective factors scores	Row average
Age groups	*M (SD)*	*M (SD)*	*M (SD)*
1	12.47 (3.85)	12.54 (3.89)	12.51 (3.86)
2	11.96 (3.83)	13.00 (3.95)	12.48 (3.92)
3	12.13 (4.16)	13.62 (3.78)	12.88 (4.04)
4	11.66 (4.24)	13.18 (4.51)	12.42 (4.44)
5	12.14 (4.05)	13.87 (4.01)	13.01 (4.12)
Column average	11.98 (4.07)	13.28 (4.13)	12.63 (4.15)

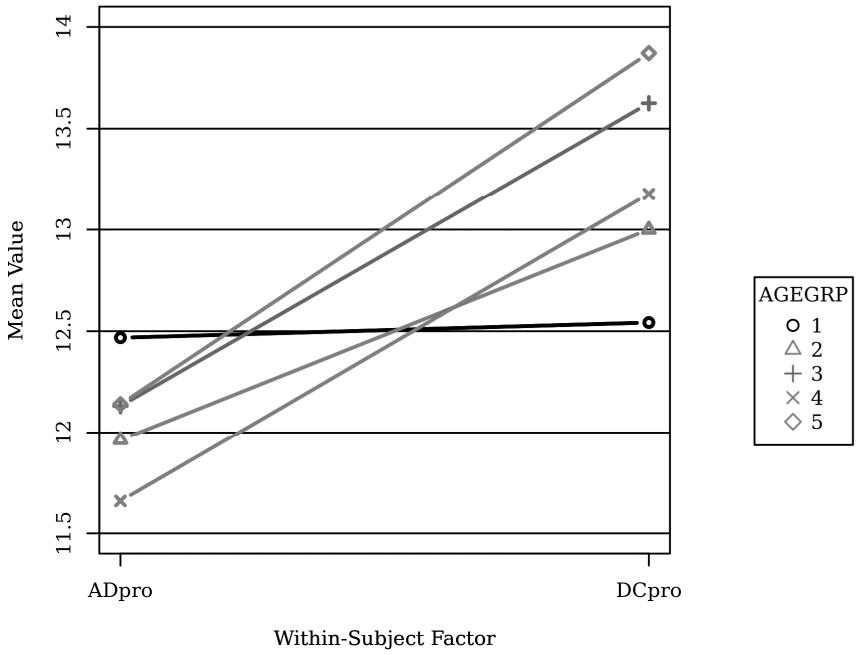

Figure 18. Protective factors means by age groups.

Post-Hoc Tests for Protective Factors and Age Groups

Post-hoc tests were conducted to further explore the significant interaction effects. Paired *t*-tests were conducted between each repeated measurement and within each category of age groups to examine the within-subjects effects. Overall admission protective factors scores were significantly smaller than discharge protective factors scores, $t = -8.74$, $p < .001$. For the first age group (ages 21-30) no significant differences were found. For the second age group (31-40) admission protective factors scores were significantly smaller than discharge protective factors scores, $t = -3.38$, $p < .001$. For Group 3 (ages 41-50) admission protective factors scores were significantly smaller than discharge protective factors scores, $t = -4.20$, $p < .001$. For Group 4 (ages 51-60) admission protective factors scores were significantly smaller than discharge protective

factors scores, $t = -5.70$, $p < .001$. Lastly, for the oldest group (ages 61 and over) admission protective factors scores were significantly smaller than discharge protective factors scores, $t = -5.26$, $p < .001$. Tukey comparisons were conducted for each repeated measurement using age groups as the independent variable to examine the between-subjects effects. No further significant differences were found for admission, discharge, or overall for protective factors scores.

Summary

This study utilized six one-within one-between analysis of variance tests (ANOVA) to determine potential differences in pre and posttest scores from the BDI-II, BAI, and protective factors from the BAM among veterans attending the Mental Health Residential Rehabilitation Treatment Program. Overall, the results indicated significant differences in pre and post-treatment scores on all three instruments, with the notable exception of very little change among the youngest age group in the protective factors pre and post-treatment measures. For the majority of the categories, length of stay and age groups did not significantly impact scores on the BDI-II, BAI, and BAM protective factors, although it is noted that the anxiety discharge scores for the oldest veterans were significantly smaller than ages 41-50. However, the older veterans' admission anxiety scores were also smaller than the other age groups. In chapter 5, interpretation of the results will be reviewed, along with the purpose of the study, limitations, implications, and recommendations for future research.

Chapter 5: Discussion, Conclusions, and Recommendations

Overview of the Study

The increasing number of veterans experiencing co-occurring substance use and mental health disorders highlights the importance of appropriate and beneficial treatment options within the VA system (Kelly & Daley, 2013). Through this study, I sought to acquire information that might provide insights on the effectiveness of residential programming that implements the integrated treatment model for the treatment of numerous disorders and symptoms, including depression, anxiety, and substance abuse. Potential differences with age groups and lengths of stay in a VA residential rehabilitation treatment program were examined by comparing pre and posttest scores on the BDI-II, BAI, and BAM (protective factors).

Interpretation of the Findings

A total of six one-within one-between, or mixed model, ANOVAs were conducted to determine the impact of age groups and lengths of stay in the residential treatment program on depression, anxiety, and protective factors scores. There were five age groups used in this study: ages 21-30, 31-40, 41-50, 51-60, and 61 and over, along with three length of stay groups: up to 33 days, 34-46 days, and 47 or more days. The findings and interpretations for each research question are discussed in this section, along with an overall summary of findings.

Interpretation of Length of stay Outcomes

Research Questions 1, 2, and 3 examined differences in depression, anxiety, and protective factors outcomes, based on length of stay in a VA residential treatment

program, from admission to discharge. For the depression outcomes, it was evident that scores on the BDI-II were significantly decreased from admission to discharge, with similar scores across the various length of stay categories. While there were no significant differences found for the pre or post treatment depression scores after a post-hoc test for between-subjects factors, the within-subjects factor indicated a statistically significant interaction between the pre and post treatment BDI-II scores. Specifically, each length of stay category had noteworthy deductions in the mean score of the BDI-II from admission to discharge, including the shortest length of stay (from 32.55 to 27.7), the moderate length of stay (33.47 to 24.97), and the longest length of stay (from 33.66 to 26.3). This indicates that MH RRTP participation was beneficial to veterans in decreasing overall depression symptoms.

For anxiety outcomes, the overall main effects indicated that BAI scores were similar across the various lengths of stay, with a significant decrease from pre to post treatment. However, the interaction effect between length of stay and pre to post treatment was not statistically significant. These overall scores indicated that veterans benefitted from the residential program in reducing anxiety symptoms without regard to the number of days that they were in the program. Specifically, the shortest length of stay BAI mean scores decreased from 23.81 to 20.94, the moderate length of stay decreased from 25.87 to 21.08 on mean scores, and the longest length of stay decreased from 26.91 to 21.92.

Finally, for the protective factors outcomes based on the BAM, the main effect for the within-subjects factor was significant, indicating that there were significant

differences between the values of admission protective factors scores and discharge protective factors scores. For all length of stay groups, the admission protective scores were significantly smaller than the discharge protective factors, indicating that veterans in the residential program benefitted by increasing their protective strategies to maintain sobriety and a recovery-oriented outlook. After post-hoc tests were completed for between-subjects effects, it was noted that the admission scores mean for moderate length of stay was significantly smaller (11.93) than for the shortest length of stay (12.75), while the protective factors mean for the longest length of stay was significantly smaller (11.17) than for the shortest length of stay.

Relating the Results to Previous Literature

A limited number of studies regarding length of stay have been conducted, but the results have varied. For instance, Coker et al. (2016) determined that length of stay was correlated with decreased symptom reduction, but the researchers noted that the improvement might be due to the intensity of the programs rather than the length of stay. This has some similarities to the MH RRTP study, as veterans can choose to have an intense treatment experience by being involved in numerous elective groups in addition to the core required CBT and SCMI groups, or they can attend the minimum requirements. Coker et al. also discovered that those who were discharged prior to treatment completion (irregular discharge) had poorer outcomes for abstinence than those who completed treatment on the discharge date that had been agreed upon during the admission process. This may lead to the conclusion that the act of completing treatment by staying until a predetermined completion date may, in itself, impact symptom

reduction. When a participant completes a goal, such as finishing a treatment episode of care, self-esteem and confidence can certainly improve, which would be reflected in the self-report measures. It is possible that scores for the MH RRTP study were impacted in a similar manner.

In a different study focusing on length of stay outcomes, a meta-analysis of 28 programs with 1,307 participants (Harris et al., 2011) indicated that participants who stayed more than 90 days demonstrated the least improvement in the Addiction Severity Index measure. In that meta-analysis, the length of stay categories were divided into 15-30, 31-45, 46-60, 61-90, and more than 90 days. However, the current study for the MH RRTP did not include such long lengths of stay. The MH RRTP data actually indicated that the longer length of stay for participants was typically 55-60 days, with one noted outlier of 78 days, an uncommon occurrence in this program. Therefore, the results of the two past studies are difficult to compare to the current investigation and illustrate the importance of completing the MH RRTP study, in that there are no similar comparisons regarding length of stay for VA residential programs treating co-occurring disorders in the current literature.

Interpretation of Age Group Outcomes

Research Questions 4, 5, and 6 examined differences in depression, anxiety, and protective factors outcomes, based on age groups, from admission to discharge. For the depression measures, the results showed that the main effect for age groups and the within-subjects factors were significant, indicating that there were significant differences between the scores on the BDI-II from pre to post treatment. However, the interaction

effect for the within-subjects factor and age groups was not significant. Between-subjects Tukey comparisons did indicate that the mean admission depression scores for the oldest group were significantly smaller than for Groups 2 and 3 (ages 31-50) and the discharge depression scores mean for the oldest participants (Group 5) was significantly smaller than for Group 3 (ages 41-50). This may indicate that the older veterans identified fewer depression symptoms at both admission and discharge than some of the other age groups. With the anxiety outcomes, it did not appear that age had a significant effect on how much anxiety scores were decreased. Rather, for all groups, the anxiety scores were significantly reduced from admission to discharge. Finally, for protective factors outcomes based on age groups, the overall admission scores were significantly smaller than discharge protective factors scores, which is to be expected, in that a goal of MH RRTP participation is to increase behaviors, support networks, and other protective aspects to maintain recovery. Additionally, the interaction effect between the within-subjects factor and age groups indicated differences among the values of admission protective factors scores, discharge protective factors scores, and levels of age groups. For Age Group 1 (ages 21-30) no significant differences were found. For all other age groups, admission protective factors scores were significantly smaller than discharge protective factors scores. The results for this analysis provide evidence that the youngest age group may not have benefitted as much as the other age groups with increasing protective factors for sobriety and maintaining a recovery-oriented outlook. However, these results should be approached with caution due to the unacceptable reliability measure of the BAM discharge scores, which is discussed in the limitations section.

Relating the Results to Previous Literature

The variable of age differences in outcomes from treatment participation, similarly to length of stay, was also not fully investigated in the literature. In a study completed by Morse et al. (2015), results indicated that older adults typically stayed in treatment for a significantly shorter timeframe, but also for that particular study, older individuals tended to have more significant psychiatric concerns. However, the authors (Morse et al., 2015) noted the possibility of these individuals placing greater perceived importance on their mental health in contrast to the younger participants, which may have led to increased motivation to stabilize their mental health. While not specifically investigated in this study, it may be interesting and informative to examine trends among the lengths of stay as they relate to the older versus younger participants. For example, a question that could be investigated is whether older veterans stay a shorter or longer amount of time than younger veterans.

There are many goals that are identified by veterans who participate in MH RRTP, with decreasing symptoms of depression and anxiety while increasing ability to maintain sobriety and a recovery-lifestyle often being cited. While these results were somewhat unexpected, it is actually a testament to the effectiveness of the program and evidence that MH RRTP participation may significantly impact outcomes on the BDI-II, BAI, and BAM protective factors. This provides support for a conclusion that symptom reduction is likely for veterans who participate in MH RRTP regardless of their age or how long they remained in the program. It also provides evidence that the integrated

treatment model, the service delivery primarily used in MH RRTP, provides effective overall care for individuals in a VA residential treatment facility.

Limitations of the Study

There were general limitations to external validity in this study. These primarily included lack of generalizability to the larger population. The results of this study only apply to veterans with co-occurring disorders who participate in residential treatment within the VA system. Because this study used a descriptive quantitative retrospective design, a true cause and effect could not be established, as it was not possible to manipulate the variables in this study or use a control group. While the study does not allow for overall generalizability to the entire population, it can provide key information about the program's effectiveness for the veterans who have participated in it.

A key limitation of this exploratory study relates to its lack of examination of long-term treatment outcomes of MH RRTP, as it instead focused specifically on treatment impact at program completion. It is widely understood and accepted that relapse is part of recovery (Decker et al., 2017) and MH RRTP participation is not immune to this phenomenon. Unfortunately, there are some veterans who tend to cycle through the program, doing well while there but then relapsing shortly after completion. However, there are also those individuals who have reported long-term maintenance with both their substance abuse and mental health disorders. It may be beneficial to explore differences in types of aftercare involvement among individuals who maintain long-term sobriety versus those who do not. Another limitation surrounds the unacceptable reliability score of the BAM protective factors (discharge scores). This was in contrast to

the reliability of the admission BAM scores, which rated as acceptable. However, because this instrument has been used and validated in prior studies (Cacciola et al., 2013; Nelson et al., 2014) and is a very common instrument within the VA system, it was still used as an outcome measurement in this study. Additionally, there was the risk of attrition bias (Salkind, 2010), in that results did not account for individuals who did not complete both the pretest and posttest for the depression, anxiety, and substance abuse measures. Finally, a limitation that should be considered relates to the potential of depression symptoms decreasing due to duration of sustained abstinence during residential treatment. This has been studied in previous research, including via a meta-analysis of 22 studies from 1980 to 2014 (Foulds, Adamson, Boden, Williman, & Mulder, 2015). While there is sometimes an increase in depression symptoms during early withdrawal, this meta-analysis demonstrated that there may be a correlation between symptoms and duration of sobriety, often during the first 3 to 6 weeks of treatment (Foulds et al., 2015).

Recommendations

While treatment for co-occurring disorders within the MH RRTP demonstrated a decrease in depression and anxiety overall, in addition to an increase in protective factors, there is a concern regarding long-term benefits and the rate of readmission for some veterans. Notably, there are many veterans who maintain sobriety and recovery, while others struggle with long-term outcomes. This predicament is not unique to veterans; civilians certainly have similar difficulties with long-term recovery. While veterans are encouraged to use their coping mechanisms that they have learned or reviewed in MH

RRTP prior to consideration for readmission (such as within an outpatient program), if they are not able to do this successfully, they will likely be readmitted to the residential program. It is recommended that future studies look at long-term sobriety and recovery following MH RRTP completion via a longitudinal approach, to determine if and where there may be a lack of continuity in maintaining use of coping mechanisms. An aspect of this has been implemented in MH RRTP but perhaps could be addressed even further. Since 2011, follow-up surveys have been sent to veterans who completed MH RRTP to determine, via self-report, if they have maintained sobriety and overall mental health stability. During 2016, approximately 14% (156 individuals) completed and returned the surveys, and during 2017, approximately 19% (133 individuals) returned their surveys. For the 2016 data, 64 individuals reported maintaining sobriety and 142 reported that their mental health was the same or better than at discharge from MH RRTP. For the 2017 data, 57 veterans reported maintaining sobriety and 121 reported their mental health as the same or better since discharge.

While the importance of aftercare is undoubtedly stressed by the staff of MH RRTP, sometimes veterans do not follow the recommendations. The structure that they received while in residential programming can be difficult to maintain after discharge, which may lead to difficulty maintaining sobriety on a long-term basis. It would also be beneficial to complete a study looking at potential differences between graduating MH RRTP veterans who participate in an outpatient program through the VA or in the community following MH RRTP and veterans who do not attend the outpatient program.

Future studies may also look at reasons for veterans not completing the posttest questionnaires, as this decreased the number of valid participant scores. Veterans may have preferred not to answer the questions, missed the outcome group (completed close to admission and again at discharge), or left the program due to an irregular discharge. Additionally, it may be useful to examine differences in outcomes between veterans who attend community support groups following residential treatment and those who do not.

There are numerous other potential studies that could be pursued for MH RRTP, including an investigation of outcomes based on the intensity of the program rather than the length of stay by identifying the number and types of groups attended, whether individual therapy was included with the traditional group therapies offered, and involvement in other therapeutic activities, such as yoga or tai chi. Another possibility is examining differences in outcomes for males versus females, particularly as the number of female veterans continues to grow. Historically, the VA has been focused more on male veterans, but over the past two decades, there have been gradual changes made to address female veterans, including changes in MH RRTP. Additional potential studies might also examine differences in outcomes for those who attend specific elective groups. While examining the elective groups outcomes is done on a more informal basis within MH RRTP, it may be useful to do this on a more formal level as the information could be beneficial for other residential treatment programs in the VA system. Finally, based on previous written information noted on the perceptions of care form and in discussions with MH RRTP participants, it may be worthwhile to pursue a qualitative

study by using veteran interviews and discuss veterans' specific perceptions on whether or not the program was helpful for them.

Implications

The implications of this study demonstrate overall that the residential treatment program at the Saint Cloud VA and utilization of the integrated treatment model, which offers an individualized and strengths-based approach, is effective for the treatment of co-occurring disorders among the veteran population. Additionally, the results from the current study support evidence for the use of CBT and MI, key components of the integrated treatment model, as core interventions in a residential program to reduce depression and anxiety symptoms. It also indicates, like previous studies, that overall length of stay has very little impact on the extent of symptom reduction (Harris et al., 2011), and that there are very few differences between age groups in symptom reduction. Overall, regardless of how long veterans participated in the program and their age at time of treatment, there was a consistent symptom reduction for anxiety and depression and an overall increase in protective factors. Because the implications demonstrate success of this treatment approach as evidenced by a decrease in scores overall from admission to discharge, there is increased validity for utilizing this model for other VA residential programs.

Implications for social change surround the need for veterans to have effective care to address co-occurring disorders that is also time and cost-efficient. Many of the MH RRTP veterans have jobs and/or other responsibilities that are impacted if they are away from their homes for an extended amount of time. Since several other VA facilities

are replicating this program, the continuing need for quality care for veterans with co-occurring disorders throughout the United States is being proactively addressed.

Conclusion

This study sought to examine outcomes based on use of the integrated treatment model in the MH RRTP. Secondary data that included self-report scores collected at the beginning and end of treatment, from the Beck Depression Inventory-II, Beck Anxiety Inventory, and Brief Addiction Monitor, were compared to determine effectiveness of the service delivery model of MH RRTP. Comparisons in outcomes were made for veterans who participated in a brief treatment episode of care (33 days or less), a moderate time frame (34-46 days), and a longer program (47 or more days). An additional component of the study was to examine potential outcome differences among age groups. While the overall results did not indicate a major influence on the length of stay towards the depression, anxiety, and protective factors outcomes, there was a strong indication that participation in the Saint Cloud MH RRTP did impact significant reductions in anxiety and depression, while also improving protective factors to maintain sobriety and good mental health. This study has provided crucial information that will be beneficial for residential treatment interventions in the VA system. It will also impact future research that seeks to examine outcomes related to specific interventions within MH RRTP, detecting differences in outcomes between males and females, and long-term prognosis for participants of the program. Most importantly, this study demonstrated the importance of effective care for veterans diagnosed with mental health and substance abuse disorders as they surely deserve the best care possible.

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Appendix A: Permission to Complete Study by Saint Cloud/Minneapolis IRB

Department of Veterans Affairs

Memorandum

Date: March 26, 2018

From: IRB Administrator, Minneapolis VA Health Care System

Subj: **"Non-Research" Determination**
Efficacy of a Veterans' Affairs Residential Program Using the Integrated Treatment Model for Mental Health and Substance Abuse Disorders

To: Kathrin Hohenstern, MSW

1. The engagement on the part of the St. Cloud VA Health Care System as part of the referenced project has been reviewed and determined to not meet the definition of research. 45 CFR 46 102(d) defines research as "*a systematic investigation, including research development, testing and evaluation, designed to develop or contribute to generalizable knowledge*". *Generalizable knowledge*, as defined by VA Handbook 1058.05 §4.a., is "*information that expands the knowledge base of a scientific discipline or other scholarly field of study*".

2. Oversight by the IRB or other Research oversight committees *is not* required.

3. Should anything in your project design change, please re-submit your proposal to the IRB for review.

4. Please do not hesitate to contact me if there are questions or concerns regarding this determination.

Julie Toth, RN, CIP
(612) 467.5655
Julie.Toth@VA.gov

VA FORM
MAR 1989 2105

Appendix B: Permission to Use BAM

From: DePhilippis, Dominick
Sent: Tuesday, February 27, 2018 10:09 AM (ET)
To: Hohenstern, Kathrin M.
Subject: RE: permission to use BAM

Thanks for consulting with me about the BAM.
The BAM and all the supporting materials created by the CESATE are in the public domain; so, there are no licensing or copyright concerns.

All we ask is that you cite the CESATE.

I will send you an email with extensive BAM guidance and support materials.

From: Hohenstern, Kathrin M.
Sent: Tuesday, February 27, 2018 11:00 AM (CT)
To: DePhilippis, Dominick
Subject: permission to use BAM

Greetings from Saint Cloud, Minnesota. I am a clinical social worker at the VA in St. Cloud and am completing a dissertation/study of our Mental Health Residential Rehabilitation Treatment Program as part of my PhD social work degree and in collaboration with the VA where I work. The program uses the BAM as a pre and post measurement of the impact of treatment. I plan to use secondary data that has already been gathered and is currently stored per VA protocol. I am nearing completion of my proposal and am seeking permission to reproduce the questions in my proposal and dissertation. I believe inclusion of the questions will provide the reader a greater understanding of this instrument. Would you be willing to provide me permission to do this? Thank you for your consideration.

Respectfully,

Kathrin Hohenstern, MSW, LICSW

Appendix C: Permission to Use BAI and BDI-II

From: Licensing
Sent: Monday, March 5, 2018 11:37 AM
To: [Email address redacted]
Subject: Re: Permissions Request
Dear Ms Hohenstern,

This response is for both of your requests - the BDI-II and BAI.

Permission to use a Pearson assessment is inherent in the qualified purchase of the test materials in sufficient quantity to meet your research goals. In any event, Pearson has no objection to you using the Beck Depression Inventory®-II (BDI®-II) and the Beck Anxiety Inventory® (BAI®) and you may take this email response as formal permission from Pearson to use the tests in their as-published formats in your student research upon purchase qualification.

The BDI-II and BAI are sensitive clinical assessments that require a high degree of qualification (B Level) to purchase, administer, score and interpret. They also represent Pearson copyright and trade secret material. As such, Pearson does not permit photocopying or other reproduction of our test materials by any means and for any purpose when they are readily available in our catalog. Consequently, you may not simply reproduce or further adapt the BDI-II and BAI test forms.

Long term license agreements with our Test Authors prohibit Pearson from providing or licensing our test materials at no charge/gratis for any purpose.

If you do not yet meet the qualifications to purchase the test materials, your professor or faculty supervisor may be able to assist you by lending their qualifications.

The following links to the product pages in our online catalog are:

For the BDI-II: https://www.pearsonclinical.com/psychology/products/100000159/beck-depression-inventoryii-bdi-ii.html?origsearchtext=100000159

For the BAI: https://www.pearsonclinical.com/psychology/products/100000251/beck-anxiety-inventory-bai.html

Finally, because of test security concerns, permission is not granted for appending tests to theses, dissertations, or reports of any kind. You may not include any actual assessment test items, discussion of any actual test items or inclusion of the actual assessment product in the body or appendix of your dissertation or thesis. You are only permitted to describe the test, its function and how it is administered; and discuss the fact that you used the Test, your analysis, summary statistics, and the results.

That said, we have prepared a few sample test items that you may include in your research results and I have attached them herein for your possible use.

Regards,

William H. Schryver
Senior Legal Licensing Specialist

Please respond only to pas.licensing@pearson.com