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RESEARCHING MEDICAL TREATMENT ASSESSMENTS FROM UNITED STATES MILITARY VETERANS DIAGNOSED WITH SUBSTANCE USE DISORDER, AND DETERMINING INTEREST IN THE MATRIX MODEL OF TREATMENT FOR POTENTIAL APPLICATION IN THEIR TREATMENT PROGRAMS

Christopher R. Strunk

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ABSTRACT

The purpose of this research study is to learn the beliefs and thoughts on the current state of medical treatment provided to United States (US) military Veterans diagnosed with substance use disorder (SUD), and gauge Veterans' levels of interest and support in the potential application of the Matrix Model of Treatment (MMT) in their healthcare programs. This proposal focused on verifying the Veterans' interest in the MMT model since the US Department of Veterans Affairs (DVA) does not currently implement this full-spectrum, 16-week treatment system. It is believed interest will be strong enough to merit supporting its consideration with approving officials at the DVA. Participants included individual US military Veterans with a previous diagnosis of SUD. A survey was distributed to qualified participants to gauge US Veterans' interests, impacts, and experiences regarding the MMT program.

The researcher calculated the frequencies of Veteran participants for each question using statistical analysis and the logistic regression model, and a comparison of the responses was conducted with a non-parametric test. While most of the surveyed Veterans indicated they were neither satisfied nor dissatisfied with current treatment methods, their reported relapse rates to substances were high. Also, Veterans conveyed overwhelming interest in trying the MMT program. It was proposed for this study that most participants will show positive interest in MMT. This project's results provide critical information regarding Veteran feedback for consideration by DVA representatives and other healthcare providers on prevention, diagnosis, intervention, and treatment preferences regarding SUD among US Veterans.

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Acknowledgments and Dedication

This research dissertation is dedicated to the memory of all United States military Veterans who have died or been maimed as the result of substance use and misuse. Although they are my inspiration to pursue this doctoral degree, many of them are unable to observe the continued and necessary efforts to improve available treatment options and health conditions for other Veterans who struggle. The project's focus is driven for them, their families, and their friends.

Additionally, thank you to my Dissertation Chairs, Dr. Diane Sevening and Dr. Susan Puumala, who have provided absolutely tremendous guidance, superior inspiration, and amazing motivation with me over the past several years in this important process. I also truly appreciate the dedicated efforts of Dr. Kory Zimney, Dr. John Korkow, and Dr. Melissa Dittbertner of the PhD committee who have consistently helped keep this project on track toward a successful completion. I am also grateful to Dr. Brooke Robertshaw for her tireless efforts, mentorship, and assistance. Thank you to each of you for your incredible examples and support.

Table of Contents

Committee Signature Page……...i
Abstract..... ii
Acknowledgments and Dedication…….iii
Table of Contents……iv
List of Figures.....v
List of Tables….....vi
Chapter 1: Introduction….....8
Background to the Problem….....9
Chapter 2: Review of the Literature..... 24
Chapter 3: Methodology……...…41
Chapter 4: Research, Findings, and Analysis of Data……..57
Chapter 5: Summary, Review, and Conclusions……...75
References…..... 90
Appendices……..... 105
Appendix A: Survey.....106
Appendix B: Informed Consent Form…….....112

List of Figures

Figure 1: SAMHSA (2015) Graph on SUD among the current Veteran population...….....26
Figure 2: NIDA (2019) Chart on US Infantry Soldiers' alcohol misuse following deployment..28
Figure 3: Cox Survival Curve of Time to Relapse vs. Treatment Completion with Veterans..…31
Figure 4: Sample Schedule of Activities from the Matrix Institute on Addictions (2014)…….. 33
Figure 5: Rawson et al. (2004) Graph showing the results of MMT vs. Treatment as Usual…..36
Figure 6: US DVA (2020) listing of treatment services for Veterans diagnosed with SUD.....38
Figure 7: Slovin's Formula, n = N ÷ (1+Ne2)……...……...45
Figure 8: ROC curve (receiver operating characteristic curve) Graph for Predictability…….....71
Figure 9: Illicit Drug Use in Past Year by Race/Ethnicity and Age Group: 2015–2019……..85

List of Tables

Table 1: Description of Veteran Organizations Contacted for Study Support……..….....48
Table 2: Sociodemographic Characteristics of Veteran Participants…….....60-61
Table 3A: Current SUD Treatment Compared with Time of Struggle Prior to Treatment…….62
Table 3B: Evaluation of Current SUD Treatment Compared with Time of Struggle Prior……62
Table 4: Current SUD Treatment Received Ratings vs. DVA Satisfaction Ratings……..63
Table 5: SUD Treatment Ratings Compared with Veteran Relapse Rates…..……..65
Table 6: Evaluation of Treatment Providers who Listen Compared to Gaps in Treatment…...66
Table 7A: Veteran Interest Levels in Trying MMT vs. Will MMT Help Other Veterans……66
Table 7B: Veteran Interest: Trying MMT vs. Determining if MMT Helps Other Veterans…….67
Table 8: Veteran Interest: Trying Relapse Prevention Groups Vs. Family Education Groups..68
Table 9: Veteran Interest in Trying the 12-Step Model During SUD Treatment…….…..69
Table 10: Area Under (a ROC) Curve (AUC) to Determine Acceptable Discrimination..…....71
Table 11: Model Fit Indices……...…..72
Table 12: Multicollinearity Statistics……...72
Table 13: Model Coefficients……..72

Chapter 1

Background to the Problem

Substance use disorder (SUD) has created substantial problems for United States military Veterans and is often connected to multiple deleterious impacts on the Veterans and their families (Teeters, Lancaster, Brown, and Back, 2017). While the Department of Veterans Affairs (DVA) and other organizations have made multiple attempts over the previous several decades to decrease the problematic expanse of substance use and misuse, the Veterans' rates of SUDs and post-treatment relapse problems have continued to increase. For example, when compared with nonveterans, Veterans have a higher prevalence of past-year tobacco use disorder (TUD) and lifetime alcohol use disorder (AUD); a minority of applicable Veterans are also reported to regularly attend an SUD treatment program (Boden and Hoggatt, 2018).

In a recent study based on the 2017 Treatment Episode Data Set-Discharge (TEDS-D) of 40,909 veteran episode observations, it was concluded approximately 94% of the Veterans receiving current treatment methods from outpatient or residential SUD treatment centers relapsed upon discharge (Betancourt et al., 2021). Many Veterans, seeking assistance in conventional SUD treatment programs, do not often have high success rates of avoiding relapse and sustaining abstinence (Teeters et al., 2017). These shortcomings during the treatment process, and notable relapses in abstinence from using illicit substances, create a significantly increased inclination toward additional symptoms and clinical diagnoses related to the individual's anger, anxiety, and depression, and there is also a considerable trend toward suicidal thoughts and behaviors among many Veterans (especially female Veterans) (Ilgen et al., 2010).

Some studies have indicated proper treatment for both SUD and additional disorders (such as post-traumatic stress disorder (PTSD)) should come from a more integrated program

considered necessary to help Veterans avoid relapse. Teeters et al. (2017) noted many Veterans are not always referred to PTSD treatment during or after completing SUD treatment. This lack of integrated treatment for Veterans could contribute to an increased likelihood of future substance relapses due to untreated PTSD symptoms coupled with chronic addictive properties resulting from many SUDs (Roberts et al., 2015). Integrated and extended-use therapy models, where both SUD and PTSD are simultaneously treated, have been developed and enhanced to help prevent relapses among civilian population groups (Sacks et al., 2008).

When properly applied, integrated treatment programs demonstrate substance use/misuse and relapses will considerably decrease should therapy be provided (Torchalla et al., 2012). Teeters et al. (2017) conducted multiple, randomized, and controlled trials of integrated treatment interventions and indicated results noting improvement in both the SUD and PTSD outcomes among Veterans.

Additionally, of importance to this study, Veterans are considered highly vulnerable to the SARS-CoV-2 (COVID-19) Pandemic's societal and personal pressures, including financial problems, worsening of behavioral health conditions (to include increasing SUD and PTSD symptoms), and a loss of contact with friends and family members (Gerber, 2020; Murphy et al., 2020; Ramchand et al., 2020). These studies indicated behavioral health conditions worsened during the COVID-19 Pandemic for Veterans, and SUD was increasingly worse for many Veterans due to their feelings of social isolation and a loss of direct contact with their healthcare treatment providers.

Feelings of social isolation combined with a loss of direct contact with healthcare professionals were considered key contributors to an increase in SUD among Veterans. A recently published study found that British Veterans reported heightened symptoms of

depression, anxiety, and PTSD, as well as increased inclinations toward anger, frustration, isolation, and alcohol use related to adversities from COVID-19 (Murphy et al., 2020). Additional studies noted economic difficulties were especially stressful for Veterans, which contributed to an increase in SUD. Ramchand et al. (2020) noted US Veterans were believed to experience greater pandemic-based economic hardships than nonveterans..

Ramchand et al. (2020) also estimated 15% of Veterans are employed with industries which were negatively impacted by COVID-19 and are noted to frequently have less financial savings in comparison to nonveterans. Finally, individual feelings of isolation from society have stemmed from COVID-19, and may contribute to the consistently increased Veteran rates of suicidal thoughts and behavior; thus, increasing treatment requirements on the Veterans' continuously stressed behavioral healthcare systems (Ramchand et al., 2020). With continued SUD and PTSD-related concerns emanating from COVID-19, additional research is necessary for SUD, PTSD, and the resulting connected hardships on Veterans to improve and expand their treatment options outside current methods. Continuous research remains essential to understanding the contributing reasons connected to an increase of SUD risks/factors as Veterans are more vulnerable to transitioning from infrequent substance use to regularly occurring substance use; this negative transition thus yields a consistent pattern of decreased mental, behavioral, physiological, and physical fitness/health among them (Boden and Hoggatt, 2018).

With increasingly high relapse rates recorded by researchers (both during and after treatment), SUD has caused significant harm to the Veteran community over the past several decades. Many Veterans seeking treatment for SUD have experienced the life-threatening stress of combat, many have PTSD, and many Veterans seeking treatment for PTSD have alcohol or other SUD related concerns (Allen et al., 2016). The continued use of research has shown

significant concerns attributed to a national medical crisis on SUD and other behavioral health needs among Veterans. PTSD has been connected to a considerably increased risk of both SUD and suicidal behavior among Veterans (Young et al., 2021). While healthcare providers continue to give SUD treatment to Veterans, an improved sensitivity to these affecting issues should influence how healthcare providers relate to clients and additionally has potential impacts for additional developments of treatment strategies. As SUD treatment has advanced considerably in recent years, developing empirically supported psychosocial interventions for SUDs and co-occurring disorders requires additional research and consideration (Marsch and Dallery, 2012).

An evidence-based study and review indicated approximately 2.5 times as many SUD clients who regularly experienced evidence-based psychosocial treatments were able to achieve post-treatment status or clinically significant abstinence rates as compared to SUD clients who did not (Dutra et al., 2008). This higher success rate, compared to those who received either no psychosocial treatment or no evidence-based psychosocial treatment, should be further tested through additional studies. While scientifically recorded evidence for psychosocial treatment and intervention (PTI) is firm, it is not regularly available and/or provided to clients diagnosed with SUD (Bickel and Marsch, 2007). This has also been proven a responsive shortcoming in structured medical systems focused on SUD interventions and treatment.

Currently, there are numerous types of interventions and treatment services available to assist Veterans who are trying to reduce/eliminate SUDs. Many of these responses include both pharmacological and psychological treatment services. A systematic study indicated more research is necessary for identifying the optimal number of CBT, MI, and other combined

therapy sessions that may help SUD clients reduce their SUD and other addiction-related problems (Cooper et al. 2015).

While prescription medications are part of the successful treatment of many SUDs, providing evidence-based psychosocial interventions is considered vital for medicinal treatments to be fully effective (Amato et al. 2011). Some of these psychosocial interventions include relapse prevention training, prosocial life skills training, and HIV-AIDS awareness/education. In multiple cases, PTI has been proven critical in the generation of necessary motivation, attitudes, skills, and information for the client to live free of SUDs.

Evidence-based psychosocial intervention has brought meaningful improvement to treatment outcomes, including treatment retention, relapse prevention, drug abstinence, and psychosocial functioning (Green et al. 2008). While mental health counselors are not conventionally required to understand pathophysiology, pharmacotherapy, and medication-based treatment in a combined treatment format as other specialized medical practitioners, they should maintain general knowledge of common medical conditions affecting patients in treatment; especially how treatment for these conditions may interact with addiction treatment medications (CSAT, 2005).

SUD has created a harmful and lasting effect on untold numbers of US Veterans and their families, and those impacted report associated professional, interpersonal and legal dilemmas and concerns at twice the rate of non-veteran civilians (Seal et al., 2011). Healthcare professionals have tried using several different treatment methods over previous years to curb SUD among the Veteran population. Conventional treatment responses through cognitive behavioral therapy (CBT) have had limited and mixed effects in the prevention of relapse among Veterans suffering from SUD (Capone et al., 2018). The primary objective of this study is to

analyze survey responses from Veterans receiving different treatment methods for SUD, and further explore how the Matrix Model of Treatment (MMT) services can potentially impact Veterans positively.

MMT has been supportive with many patients over the past few decades (SAMHSA, 2016). The MMT program serves as an organized and multi-tiered behavioral treatment model which consists of evidence-based methods supporting and implementing individual therapy, group therapy, family therapy, relapse prevention and avoidance, substance use education and awareness, and self-help services delivered through a clinically coordinated and sequential system (NIDA, 2012).

Importance of the National Medical Problem

Based on the multi-tiered and detrimental impacts associated with SUDs, increased attention to the identification of supportive and evidence-based treatment through the combined model is essential. SUDs continue to cause significant and detrimental problems for US Veterans and are often connected to multiple harmful effects for them and other people connected to them (Institute of Medicine, 2013). The DVA has organized and made multiple attempts over recent decades in effort to reduce SUD rates, but SUD rates have only continued to rise among the Veteran community (Teeters et al., 2017). SUDs have also been suggested to cause considerable negative conditions, especially medical concerns, additional psychological disorders (anxiety, depression, PTSD), employment and interpersonal conflicts, and increased rates of suicidal behavior.

Widespread and increasing SUD rates add to public health problems across the country. A recent study of Veterans uncovered that an estimated 30% of completed suicides were preceded by substance use, and approximately 20% of high-risk behavior-related deaths were

directly connected to high drug or AUD (Department of the Army, 2010). Within the study, Veterans presenting for initial entry healthcare needs within the VA medical system, approximately 11% met the criteria for a SUD diagnosis (Seal et al., 2011). In keeping with general population ratios, SUD diagnoses are more frequently recorded among male over female Veterans (Seal et al., 2011):

1. 10.5% AUD and 4.8% illicit drug use disorders for male Veterans
2. 4.8% AUD and 2.4% illicit drug use disorders for female Veterans
3. Increased experience among younger and non-married Veterans (< 25 years of age)
4. Demographics of higher rates of SUDs (male and young) in the civilian population constitute a higher proportion of the military population, which may contribute to an increased risk of certain SUDs relative to civilians.

Purpose of the Study and Research Questions

This research study is to generate data to assess current treatment beliefs and interest in MMT application for Veterans diagnosed with SUD. While the DVA does not currently use this extensive 16-week system, it is believed the results of this study will be beneficial in advancing support for MMT as a SUD treatment method in DVA healthcare systems.

The primary research question for this project is, "Are Veterans, who have been diagnosed with SUD, satisfied with current treatment methods provided by the US DVA healthcare system?" This question was selected to assess current attitudes, beliefs, and opinions on current treatment methods provided to Veterans.

The secondary research question for this project is, "Once Veterans receive information on MMT for SUD treatment in the civilian population, will a majority of surveyed Veterans demonstrate positive interest in this treatment program?" Information about the MMT model

will be shared with surveyed Veterans, and interest levels in MMT will be gauged from them. The DVA does not currently and directly employ the MMT's 16-week system of treatment. Therefore, this second question was selected to help provide understanding on their interest levels for applying MMT in their current treatment environments. They will also be given the opportunity to understand how MMT could possibly be effective in helping both nonveterans and Veterans alike with relapse prevention during SUD treatment.

Hypotheses

Alternative. After reviewing material explaining the use of the MMT program in the civilian population, interest in the MMT program will be generally positive among over 50% of SUD-diagnosed Veterans surveyed.

Null. After reviewing material explaining the use of the MMT program in the civilian population, interest in the MMT program will be generally positive among less than 50% of SUD-diagnosed Veterans surveyed.

Specific Aims

This research project seeks to receive information from Veterans on their assessments of current treatments for SUD, advance public knowledge based on their anonymous feedback and responses and determine interest in the combined use of psychosocial treatments in the MMT program for Veterans in recovery from SUD. Jhanjee (2014) hypothesized the longer the recovering individual actively participates in sustained treatment, the greater his/her long-term prognosis. While these advances continue in developing helpful combinations of psychosocial treatments, they have not yet been translated to routine responses in Veterans' medical treatment environments nationwide. During these continued advances, consistent advocacy of

psychosocial based healthcare and treatments should be funded and supported for Veterans in the process of SUD treatment and recovery.

Since psychological treatment and its evidence base should be expanded, there should also be further research on combined use of therapies and any noticeable effects (Jhanjee, 2014). Traditional intervention and treatment are often limited to one specific method, but the goal of this project is to further demonstrate interest in a combination of psychosocial methods that might be more effective in reducing SUD among Veterans than singular responses.

Specific Aim 1: Assess current treatment for Veterans who are suffering from SUD and receiving proper treatment and determine satisfaction with current treatment provided by the DVA.

Specific Aim 2: Determine whether a combination of psychosocial treatments, using the MMT program, would be considered and accepted by Veterans in treatment for SUD.

The integrated programs using the combined approach require behavioral health teams to coordinate a range of treatments, including substance detoxification, medication management, CBT, and motivational interviewing (MI) (Drake et al. 2004). Research further notes the combined approach has problems due to limited available resources and notable absences of well-defined guidelines (Institute of Medicine, 2010). The evidence base for psychological treatment should be expanded including additional specific guidance and should also include research on optimal combinations of psychological therapies and any matching effects. This should create results where Veterans are provided multiple opportunities to pursue a combination of treatment (if preferred) for the recovery process from SUD. While psychological treatment and interventions are critical components of the recovery regimen, additional efforts are

suggested to integrate a combination of evidence-based interventions in all SUD treatment programs for Veterans.

Significance of the Study

It is hoped this study will help gain insights on current Veteran attitudes and opinions toward their current treatments. It is also hoped this study will provide them with information on the MMT system and give Veterans the opportunity to learn more about a program which has been both supportive and effective among patients seeking SUD treatment in the civilian population. The significance of this study is to analyze and explore the Veterans' responses and determine their interests in current methods of treatment provided to them. It is also believed a review of their interest levels in trying the integrated MMT program could potentially affect SUD treatment for Veterans.

In terms of education and practice, this project is intended to provide information which is relevant to current healthcare providers for their application of current treatment methods. It is also intended to help provide clarity on what may be appropriate for SUD treatment for Veterans into the future. This project also aims to support the training, practice, and education needs of newly developing behavioral health counselors and other healthcare staff so they may have a proper assessment of modern SUD treatment methods as received by Veterans. Regarding the applications of this project for research, the methods, and concepts herein can be replicated for additional research. It is also believed this project's findings and results should be in accordance with the findings and results of other similar studies regarding SUD and Veterans. In terms of public policy, this project intends to provide current information regarding the growing demand and need for SUD treatment and support to Veterans. This project is focused on bringing attention to current beliefs, opinions, concerns, and interests of Veterans receiving SUD

treatment, and their answers should be relevant to the continued development of public policies as they pertain to SUD treatment for them.

The relevance of this study is to determine assessments of current SUD treatment methods among Veterans, and gauge their interest levels in trying MMT. Current treatment methods should be assessed in order to determine their effectiveness among Veterans. The relevance of Veteran assessments is important to consider, as relapse rates have been recorded in other research studies among Veterans as increasingly high. Because these relapse rates to SUD are high, researchers must continue to determine reasons for why these relapse rates remain high and continue to increase among the Veteran population in particular. Perhaps it can also be determined if other treatment methods, such as MMT, may be effective among Veterans in reducing their previously recorded high relapse rates.

The systematic implementation and consistent use of the 16-week MMT model into SUD treatment programs for US Veterans has never been officially provided by DVA healthcare staff but should be a results-driven response to SUD given previous and evident success rates with non-veteran clients. Proper integration of this treatment model consists of 16 weeks of individual and group therapy sessions hosted at a minimum of three times each week, with additional blended use of CBT, social support networks, family-focused education programs, individual-focused counseling, and consistent urinalysis testing (Rawson and McCann, 2014).

The project's second aim is focused on assessing the effectiveness of current treatments provided to Veterans. Providing Veterans with new anonymous surveys will give them the opportunity to voice any current concerns or interests they have. Attaining Veteran feedback and assessments on current treatments can also help support the importance of trying new methods and approaches such as the MMT program. The surveyed Veterans will be evaluated for results

following the introduction and explanation of the MMT program and its previous success rates among civilians who participated in it. The second aim of this study requires researchers to evaluate and review the extent to which Veteran interest in the MMT program is present after the Veterans review explanatory materials detailing the MMT process. This will be achieved through analysis of their survey responses, where their interest levels in MMT can be determined.

The participants' responses in this project could potentially be used to provide new information that the MMT method is something the Veterans would like to try in their SUD treatment programs. Further, the study may show these treatments should be consistently explained to other Veterans in other treatment settings for their consideration and potential implementation among larger populations. Finally, the results of this study will help bring awareness that newer integrated treatment models can be explored in helping reduce relapses and support abstinence for people diagnosed with SUD.

The project's results will demonstrate the current self-reported satisfaction levels among Veterans receiving SUD treatment, and it will also demonstrate the levels of interest Veterans may have in trying the MMT program. This identified connection between previous research studies and current research may help facilitate MMT interest levels and treatment success rates among Veterans diagnosed with SUD. Beyond treating SUD, the use of MMT could potentially be considered in the treatment of other behavioral health disorders impacting not only this study's participating Veterans, but the potential to assist greater numbers of Veterans as well.

Continuous applications of MMT toward future research should be applied by other healthcare professionals. MMT's blend of multifaceted treatment responses could provide new options and results for counselors and Veterans alike during national health crises pertaining to

SUD. Results from this research should motivate others to study the use of MMT and other highly integrated treatments for a variety of SUD-related health concerns.

Terminology

Substance Use Disorder (SUD): SUD is a DSM-5 diagnosable disease which is sub-categorized into different designations based on the substance used and usage severity. SUD is defined as "a problematic pattern of using alcohol or another substance that results in impairment in daily life or noticeable distress," (DSM-5, 2013). The DSM-5 (2013) delineates SUD into the following sub-categories based on the substance and severity of use, and the the following diagnosis categories qualify Veterans to participate in this project's research. The DSM-5 referenced these sub-categories of substance use disorder, and they are diagnosed as Alcohol Use Disorder, Phencyclidine Use Disorder, Inhalant Use Disorder, and several other disorders referenced below.

Alcohol Use Disorder (AUD): Alcohol Use Disorder is defined in the DSM-5 (2013) as, "a problematic pattern of alcohol use leading to clinically significant impairment or distress, as manifested by at least two of the following [criteria], occurring within a 12-month period." For information on criteria, please see the DSM-5 (2013).

Phencyclidine Use Disorder (PUD): Phencyclidine Use Disorder is defined in the DSM-5 (2013) as, "A pattern of phencyclidine (or a pharmacologically similar substance like ketamine) use leading to clinically significant impairment or distress, as manifested by at least 2 of the following, occurring within a 12-month period." For more information on the criteria, please see the DSM-5 (2013).

Inhalant Use Disorder (IUD): The DSM-5 (2013) defines IUD as, "a pattern of inhaling hydrocarbon-based fumes, such as those found in solvents or paints, for the purpose of altering

the mental state and leading to significant clinical impairment, and classifies its repeated use as a pattern of substance abuse." For additional information on IUD, please see DSM-5 (2013).

Stimulant Use Disorder (StUD): Stimulant Use Disorder (StUD) is defined in the DSM-5 (2013) as, "the continued use of amphetamine-type substances, cocaine, or other stimulants leading to clinically significant impairment or distress, from mild to severe." For information on criteria, please see the DSM-5 (2013).

Other Hallucinogen Use Disorder: Other Hallucinogen Use Disorder is defined by the DSM-5 (2013) as, "a problematic pattern of hallucinogen use (not phencyclidine or phencyclidine-like substances) use leading to clinically significant impairment or distress." For more information on criteria, please see the DSM-5 (2013).

Opioid Use Disorder (OUD): Opioid Use Disorder is defined by the DSM-5 (2013) as, "a problematic pattern of opioid use leading to clinically significant impairment or distress." For more information on criteria, please see the DSM-5 (2013).

Tobacco Use Disorder (TUD): Tobacco Use Disorder is defined by the DSM-5 (2013) as, "a problematic pattern of tobacco use leading to clinically significant impairment or distress, as manifested by at least two of the following, occurring within a 12-month period." For additional information on TUD criteria, please see the DSM-5 (2013).

The Matrix Model of Treatment (MMT): MMT, by design, is a 16-week intensive treatment model for SUD (Rawson and McCann, 2014). Originally designed to treat cocaine and methamphetamine users, MMT is currently implemented to treat any form of SUD and has also been adapted for residential inpatient environments (Weiner, 2016).

United States Military Veteran (Veteran): A Veteran is defined as "a person who served in the active military, naval, or air service and who was discharged or released under conditions other than dishonorable" (Title 38, 2020).

Critical Barriers or Problems

This study is intended to assist with reducing the barriers and problems Veterans are currently experiencing in treatment, since their relapse rates have been reported as increasingly high. It is necessary to note the considerable barriers and requirements related to the use of the PTI treatment plans with pharmacotherapeutic intervention. Additionally, many healthcare insurance companies are not yet aligned with financially supporting the widespread use of the MMT program, and often will only pay for one or two particular types of treatment rather than assist with the monetary support and implementation toward a full-spectrum response. Despite evidence-based research and success in states such as California, the combined approach is underused throughout most of the country (Rawson et al., 2004).

Since relapse rates have been noted as increasingly high, it is necessary for future studies to determine the precise reasons why Veterans have these high relapses back to SUD. Perhaps feelings of isolation and remoteness may be part of the problem. The DVA Office of Rural Health recently reported there are approximately 3.4 million rural Veterans (41%) who comprise the total number of Veterans currently enrolled in the DVA medical system (Wong, 2011). Some Veterans may feel they are too far removed physically from healthcare treatment facilities to seek help.

Veteran access to healthcare, especially behavioral health support, is reported as problematic for many Veterans who reside in rural areas. Improving Veterans' access to combined behavioral health treatment modalities through tele-mental health could improve the

quality of life for Veterans who reside in rural areas (Wallace, Weeks, Wang, Lee, and Kazis, 2006).

The efficacy and feasibility of care have been demonstrated in the use of tele-mental health in remote locations among both civilian and Veteran populations (Gros, Morland, and Greene, 2013). Perhaps this technology, along with the use of integrated treatment models such as MMT, may be of greater benefit to Veterans who are trying to reduce their relapse rates to SUD. Another concern among Veterans is the need to sustain an independent attitude and feelings of outright refusal to seek treatment for SUD. Many Veterans have reported a contributing reason they do not seek treatment is due to the "suck it up" mentality, which promotes the concept of help-seeking behavior and entering the treatment setting as "weakness" (Cheney et al., 2018).

Summary of the Introduction Chapter

This research project supports a dissertation designed to examine the current effectiveness of treatment programs in place to support Veterans diagnosed with SUD, and it also will determine if interest exists in trying new and expanded treatment models such as MMT. The MMT program has been shown to be successful with many civilians diagnosed with SUD over the past few decades, and it is believed this program will also be of considerable benefit when provided to the Veteran communities seeking help at DVA healthcare facilities. The Substance Abuse and Mental Health Services Administration (SAMHSA, 2015) reported 1 in 15 Veterans currently has an SUD. Given these numbers, it is necessary to conduct additional research to determine new courses of action focused on remedies for this increasingly harmful trend.

Chapter 2:

Review of the Literature

This study's applicable literature is focused on demonstrating current SUD problems in the Veteran community, past and current SUD trends among Veterans, applicable SUD treatment programs, and the interest, success, and effectiveness of the MMT in the US for those afflicted with SUD. The DVA does not currently use this system of treatment, but it is believed the results of this study will be beneficial in generating interest and support to advance MMT as a SUD treatment method within DVA healthcare systems.

While current DVA treatment is considered effective for helping Veterans avoid relapse, there are not many studies to determine interest in expanding treatment for Veterans to include a more comprehensive approach. Relapse prevention and abstinence are the goals of all SUD treatment programs, so it is suggested the MMT program will help increase effectiveness and inclinations toward these goals among the Veteran community as proven effective with the civilian community.

SUD, Stigmas, and Veterans Over the Past Two Decades

SUD has created a significant problem for Veterans, in both untreated SUD conditions and high relapse rates after treatments, over the past several decades. Teeters et al. (2017) noted the rates of SUDs among the US Veteran community are increasing, and SUDs are frequently connected to considerably harmful correlates. These negative factors often include additional psychological disorders (anxiety and depression), physiological problems, interpersonal and employment strife/difficulties, and a notable increase in suicidal intent and behavior. The National Institute on Drug Abuse (NIDA, 2019) noted the overall opioid overdose rates of Veterans significantly increased from 14% in 2010 to 21% in 2016. NIDA (2019) further noted

this overdose increase rate among Veterans was largely from heroin and synthetic opioids, and not from pharmaceutical opioids prescribed for individual pain relief. However, it is also important to note many Veterans who are suffering from heroin use and other synthetic opioid use may have started with a pharmaceutical opioid addiction, and then experienced an abrupt end to these prescriptions without their SUD properly treated. Hence, these Veterans continue with pain and/or SUD and now may have chosen "illegal" forms of opioid consumption and use due to a lack of additional options.

To further understand the significance of this problem, Kline et al. (2022) surveyed 4,000 Veterans and noted less than 33% of those with a potential mental health disorder or SUD reported consistent and regular engagements with mental health professionals. Additionally, Sharp et al. (2015) noted approximately 60% of military members and Veterans who suffer from behavioral health problems do not seek support or treatment for their conditions, and this refusal is often attributed to stigmas about "weakness" held by military members and Veterans.

Regarding behavioral healthcare needs and associated stigmas from Veterans, Williams (2022) noted many Veterans seem more inclined to speak with their families and friends rather than seek professional treatment from DVA clinics or healthcare facilities. Finally, Kline et. al (2022) provided results demonstrating Veterans who reported increased rates of behavioral health difficulty, such as depression and anxiety, also endorsed higher "grit" responses and were less interested in accessing behavioral health care than Veterans who endorsed lower levels of "grit."

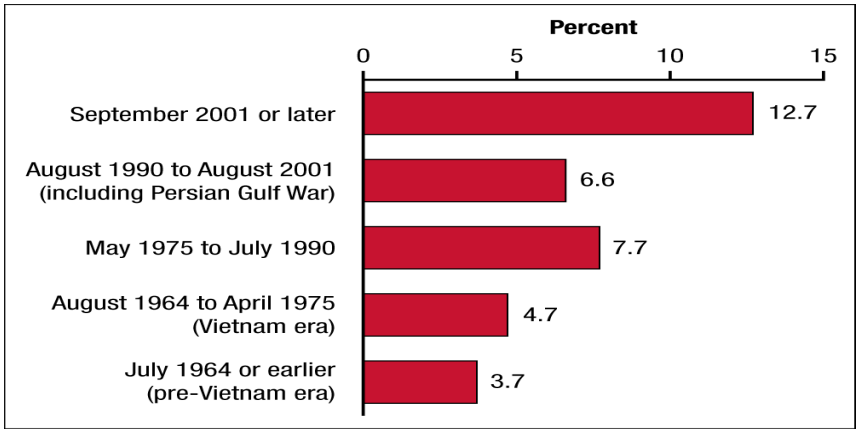
Pervasive substance use and illicit substance access throughout the country continue to cause a variety of problems for military Veterans and their families (Larson et al., 2012). These problems are often psychological, physiological, social, and public health oriented. The lengths and environments of Operation Iraqi Freedom and Operation Enduring Freedom deployments are

connected to unpredictable and unconventional work requirements and mandates for US service members (Hoge, 2011). It is posited this high level of stress contributes to an increasing number of co-occurring physical, psychological, and substance use concerns and problems for Veterans recently separated from the active duty military (Larson et al., 2012).

As an example of this hardship, military personnel on mandatory third and fourth overseas deployments indicate considerably greater problems than personnel on the first or second deployment (Hoge, 2011). This culmination has been linked to increased levels of marital and family difficulties, acute stress levels, psychological difficulties and dysfunction, and growing rates of medication usage for combat-related stress (MHAT, 2006). Notably for the case of other specific medical concerns, there is increased attention placed on providing evidence-based treatments for people who suffer from SUDs. The continuous and growing problems stemming from SUD (along with additional and multiple related psychiatric disorders) in the Veteran community highlights an urgent need for new treatment solutions, and testing, evaluation, and analysis of two of these newer models.

Figure 1

Increase in SUD Rates among Veterans over Time



Note: The above graph details the increase of SUD among the current Veteran population. Graph provided by SAMHSA (2015).

There has been significant progress toward the standardization and continued development of treatment (psychosocial in nature) for SUDs. Psychosocial-based healthcare and treatments are currently construed as critical components to today's comprehensive SUD treatment initiatives (Jhanjee, 2014). There is a connection between psychosocial issues in addiction-related disorders and the effective support psychosocial interventions create during treatment (Kline et al., 2009). Jhanjee (2014) indicated examples of successful psychosocial interventions (evidence-based) from previous research include:

1. Cognitive behavioral therapy (CBT)
2. Motivational interviewing (MI)
3. Contingency management
4. Brief interventions
5. Relapse prevention therapy

Combining several forms of therapy for integrated treatment is not a new method. Cognitive behavioral therapy (CBT) may reduce alcohol consumption among patients, but a combination of placebo pills and regular meetings with medical professionals has a stronger and more positive impact with the patients than CBI alone (Anton et al., 2006). CBT is a key component of the MMT program, and feedback from Veterans on CBT is important to this study. Their feedback is essential to continuing research, promotions, and sustainment of combined psychosocial treatments to Veterans and military family members who are recovering from SUDs.

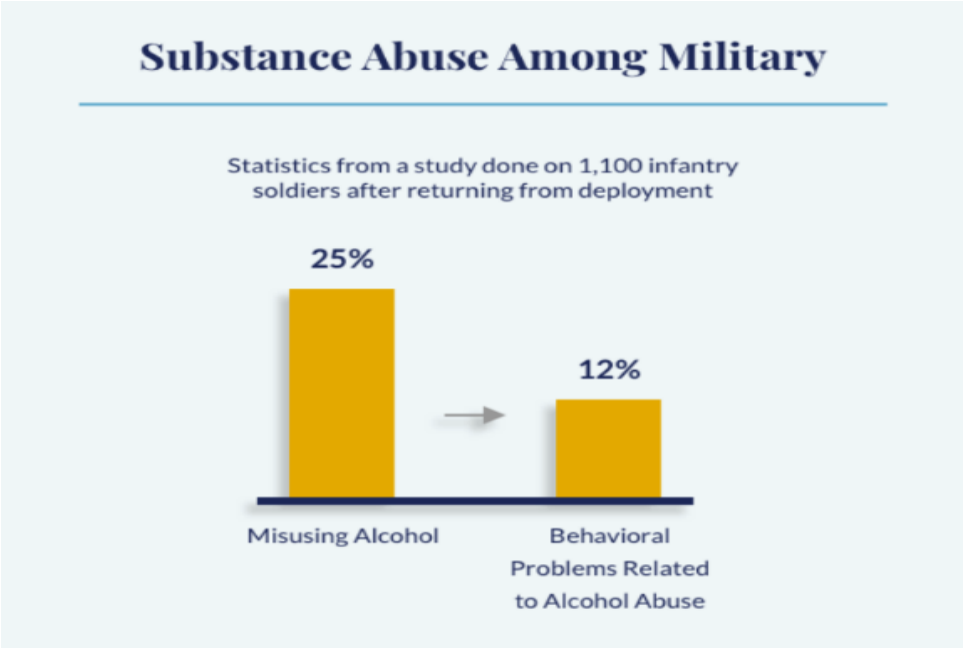
A review of Veteran feedback could help provide insights which may ultimately reduce and possibly end periods of relapse following SUD intervention, treatment, and long-term management through combined treatment methods as suggested in previous studies (Anton et al., 2006). Psychological treatment is more effective when prescribed with medication over the

singular use of treatment or medication alone, and this was especially true for those diagnosed with misuse/abuse of opiates (Kline et al., 2009). Modern research clarifies psychosocial interventions for SUD and chemical dependence can promote positive behavioral changes (Jhanjee, 2014).

Guina et al. (2016) posited interpersonal trauma (Potential PTSD connected to sexual or physical abuse) has also been linked to the potential of SUD development for US Veterans. Teeters et al. (2017) also noted ~11% of US Veterans meet the criteria for a diagnosis of SUD among those arriving for first-time healthcare services at the DVA hospital and clinic environments. Schnurr (2014) also noted an increasing trend between Veterans suffering from SUD and other behavioral health disorders and a considerable rise in unemployment and homelessness among them.

Figure 2

Substance Abuse Among Military Veterans Returning from Overseas Deployments



Note: The National Institute on Drug Abuse (NIDA, 2019) detailed the chart above pertaining to US Soldiers during the return from an overseas deployment obligation.

Many Veterans, who suffer from SUD, consume legally distributed and purchased products. Hoggatt et al. (2017) referenced heavy episodic alcohol consumption and cigarette use as the two more prevailing forms of SUD among US Veterans. Larson et al. (2012) noted this concern is often related by friends and family members of Veterans who observe symptoms of SUD, but the Veteran may not seek treatment since the consumption of cigarettes and alcohol is legal.

Current treatment services provided directly by the DVA do not appear to be effective with Veterans seeking SUD treatment. A 2021 Veteran suicide was recently investigated by the DVA Office of the Inspector General (2021), and found DVA staff did not properly assess the Veteran's substance use, coordinate relevant historical data into his treatment plan, or address the Veteran's change in demeanor and concerning statements. Additionally, Decker et al. (2017) noted Veterans who participate in the DVA's aftercare treatment service have not had a significantly lower relapse rate; additionally, the DVA aftercare services' average number of attended sessions among Veterans was low.

A key component of the MMT program (not currently in official DVA medical treatment plans) involves the regular use of the 12-step recovery treatment model. Decker et al. (2017) provided findings that 12-step aftercare treatment attendance has been associated with a decreased risk of relapse. After reviewing DVA treatment methods, it is not clear why DVA hospitals and clinics do not currently provide the 12-step recovery program directly to Veterans seeking treatment at DVA facilities. Donovan et al. (2013) detailed many behavioral health staff serving in non-specialty healthcare settings are unfamiliar with the primary goals of the 12-step program and 12-step mutual support groups, about the various styles of 12-step meetings and the

way these meetings are carefully organized and managed; they are additionally and consistently less familiar with positive outcomes directly associated with involvement in 12-step programs.

Donovan et al. (2013) additionally suggested behavioral health representatives should be encouraged to increase their familiarity with 12-step programs and their success rates among those actively participating, work to connect patient needs with specific mutual support groups, incorporate the implementation of community-based 12-step volunteer members to create "bridges" for these groups, and use empirically supported 12-step programs adapted to the specific features of the treatment environments.

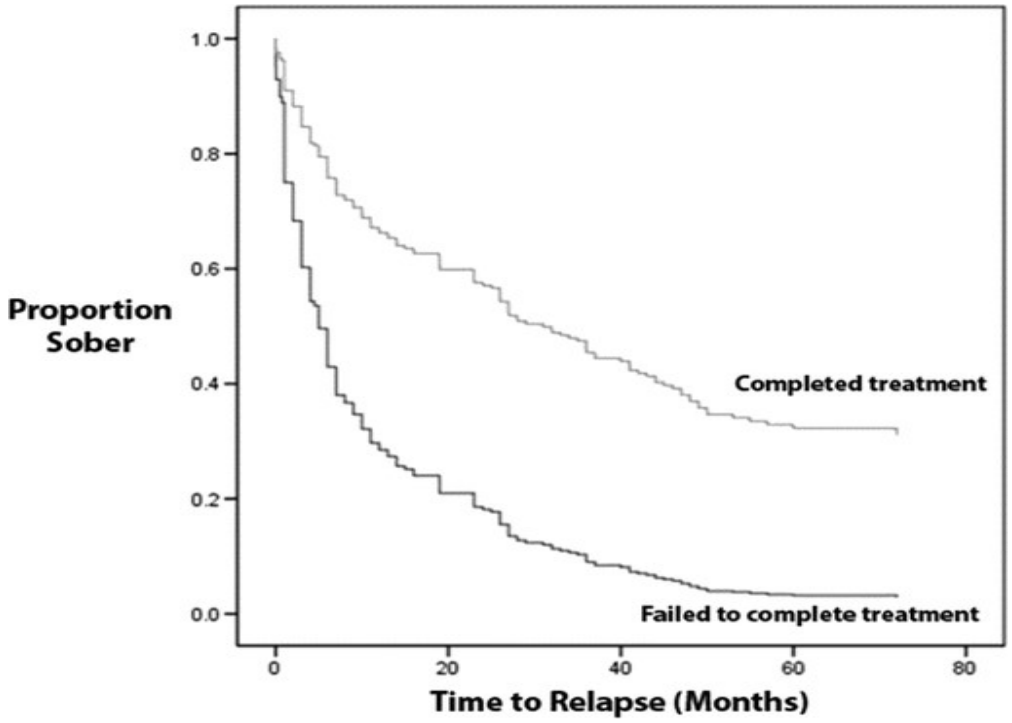
Between the years 2018-2020, surveyed US military personnel noted their diagnosis of AUD and reported not receiving proper treatment to resolve current issues and symptoms, and many indicated they received no treatment at all (Department of Defense, 2022). Previously, the 2015 DVA Report from the Office of the Inspector General noted, in its seventh findings statement, a recommendation that DVA Mental Health Services should encourage more widespread incorporation of treatment programming with specialized emphasis on mental health comorbidities. This recommendation encourages DVA to explore additional methods focused on treatment of Veterans suffering from SUD and co-occurring disorders. MMT, when fully implemented and applied. can focus on treating SUD and mental health disorders both concurrently and simultaneously (Rawson and McCann, 2014).

The need for innovation, novel approaches, and evidence-based recommendations, interventions, and solutions is essential to treating Veterans suffering from SUD. Consistent movement to overcome obstacles for Veterans seeking new treatments are essential for their access (Teeters, et al. 2017). Some researchers are pursuing new and developing ideas to assist with additional treatment updates. Linke et al. (2019) organized and implemented the Go-VAR

(Veterans Active Recovery) research project to review the potential of a multi-tiered physical exercise and intervention program designed for Veterans receiving SUD treatment. Many other integrated SUD treatment programs and methods have demonstrated positive success rates among participating patients, with decreased relapse rates serving as one of the key factors of notable change and development.

Figure 3

Increase in SUD Relapse Rates and Reduction of Sobriety Among Veterans over Time



Note: The Cox Survival Curve of Time to Relapse vs.Treatment Completion summary, as provided by Decker, Peglow, Samples, and Cunningham (2017) details the following: The DVA's current treatment methods are demonstrating a consistently high pattern of SUD relapse and a reduction in sobriety among Veterans seeking medical treatment. It is possible extensive treatment models (such as the MMT 16-week program) may be necessary for Veterans who suffer from SUD in order to help reduce their relapse rates and increase sobriety rates.

According to Linke et al. (2019), their 12-week pilot study combined psychoeducation with physical exercise regimens and demonstrated a decreased use among participants of both alcohol and other addictive substances as the project concluded. This is one of several potential

models which can potentially help Veterans seeking SUD treatment from the DVA. For Veterans who are interested in pursuing additional programs during SUD treatment, the MMT model may also benefit them.

The US Surgeon General's Report on Alcohol, Drugs, and Health (2016) formally recognized and noted scientific trials conducted over the past two decades demonstrated MMT as effective in the reduction of substance misuse and other connected risk-based behaviors. MMT is also recommended, recognized, and empirically supported by the National Institute on Drug Abuse (Weiner, 2016). While the DVA does provide treatment services to Veterans who are diagnosed with SUD, DVA healthcare facilities do not provide the 16-week MMT model as a method of SUD treatment to them (DVA Guide to Mental Health Services, 2012).

Additionally, the DVA provides extended-stay programs designed for in-patient treatment through the Mental Health Residential Rehabilitation Treatment Programs (MH RRTPs) focused on Veterans seeking treatment for SUD, but MMT is not a treatment option provided by DVA to them (DVA MH RRTP, 2022). Finally, the DVA does not offer the MMT model to Veterans suffering from SUD in their evidence-based therapy programs (DVA Evidence-Based Therapy, 2022). After carefully reviewing multiple DVA-sponsored treatment programs (DVA Evidence-Based Therapy, 2022) designed for Veterans suffering from SUD, it was noted that opportunities to participate in the 12-step recovery program (a key component for the MMT program and other successful integrated treatment programs) is not directly provided at DVA hospitals or clinics. The reasoning for why the 12-step treatment program is not officially supported at DVA medical facilities is currently unknown.

Figure 4

A Sample Schedule of Patient Activities from the Matrix Institute on Addictions (2014)

A sample schedule for the Matrix IOP program:

INTENSIVE OUTPATIENT PROGRAM SCHEDULE						
Week	**Monday**	**Tues.**	**Wed.**	**Thurs.**	**Friday**	**Saturday & Sunday**
Weeks 1 Through 4	**6-7 PM** Early Recovery Skills **7-8:30 PM** Relapse Prevention	12-step Meeting	**7-8:30 PM** Family Education Group	12-step Meeting	**6-7 PM** Early Recovery Skills **7-8:30 PM** Relapse Prevention	12-Step/ Spiritual Meetings and Other Recovery Activities
Weeks 5 Through 16	**7-8:30 PM** Relapse Prevention Group		**7-8:30 PM** Family Education Group **or** Social Support		**7-8:30 PM** Relapse Prevention Group	
Weeks 17 Through 52			**7-8:30 PM** Social Support			
Urine testing and breath-alcohol testing conducted weekly Ten individual sessions during the first 16 weeks						

Note: Detailed above is a sample schedule from the Matrix Institute on Addictions (2014), demonstrating a variety of group meetings and therapy sessions. It is believed this regimented and multi-tiered approach to SUD can be as effective with treating Veterans as it has been in treatment settings for the civilian population.

While it is suggested focused treatment is essential to relapse prevention and the cessation of SUD, it is unclear how Veterans will respond to and/or support the implementation of a combined approach for treatment services. The MMT method provides 16 consecutive and scheduled weeks of quality services through a combined series of treatments. Specifically, MMT incorporates techniques from CBT and MI to allow family members and significant others to participate in the treatment sessions with the individual. This combined approach allows the individual to see the perspectives of people close to him/her, while simultaneously providing counseling/education support to them together. Kline et al. (2009) noted behavioral health treatment can be more successful when prescribed with medication over the singular use of SUD psychotherapy treatment or medication alone, and this was proven true for those abusing opiates.

Wells, Valente, Peavy, and Jackson (2013) noted psychosocial treatment approaches are effective in treating patients who suffer from SUD . Wells et al. (2013) also noted these integrated and multifaceted treatment methods are supported by additional empirical research as well as the positive feedback provided by their respective patient populations. This modern research demonstrates psychosocial interventions for SUD and chemical dependence can promote positive behavioral changes. After conducting similar research, Subodh, Sharma, and Shah (2018) noted the beneficial impacts of psychosocial approaches to SUD treatment in terms of maintaining abstinence, adhering to medication requirements, sustainment of healthy life choices, enhanced integration within the community, occupational rehabilitation and an overall improvement in individual functions. During these consistent research-based advances, the development of supportive combinations of psychosocial treatments and medications continues. Current research shows many combined approaches have not yet been universally translated to routine responses across healthcare and medical treatment environments throughout the nation.

As these advances continue, additional contributions and advocacy of psychosocial based healthcare and treatments should be funded and supported for Veterans in the process of recovery from SUDs. As mentioned previously, CBT is a key component of most integrated treatment methods (including MMT). Ray, et al. (2020) noted positive results from patients conducting combined CBT and pharmacotherapy over less-integrated SUD treatment methods. Ray et al. (2020) also indicated a combination of medication and regular therapy sessions with a variety of medical representatives demonstrated stronger and more positive effects with patients than CBT alone. Jhanjee (2014) noted psychological treatment and its evidence base should be continuously evaluated and expanded, and there should also be further research on combined use of therapies and any noticeable effects. Wüsthoff, Waal, Gråwe, (2014) also noted lower relapse

rates among patients using integrated treatment methods, and these same patients demonstrated increased motivation for SUD treatment after 12 months of continuous integrated treatment. Traditional intervention and treatment is often limited to one specific method; however this project's goal is to further demonstrate how a combination of psychosocial methods through MMT will be more effective in reducing SUD among Veterans than singular responses.

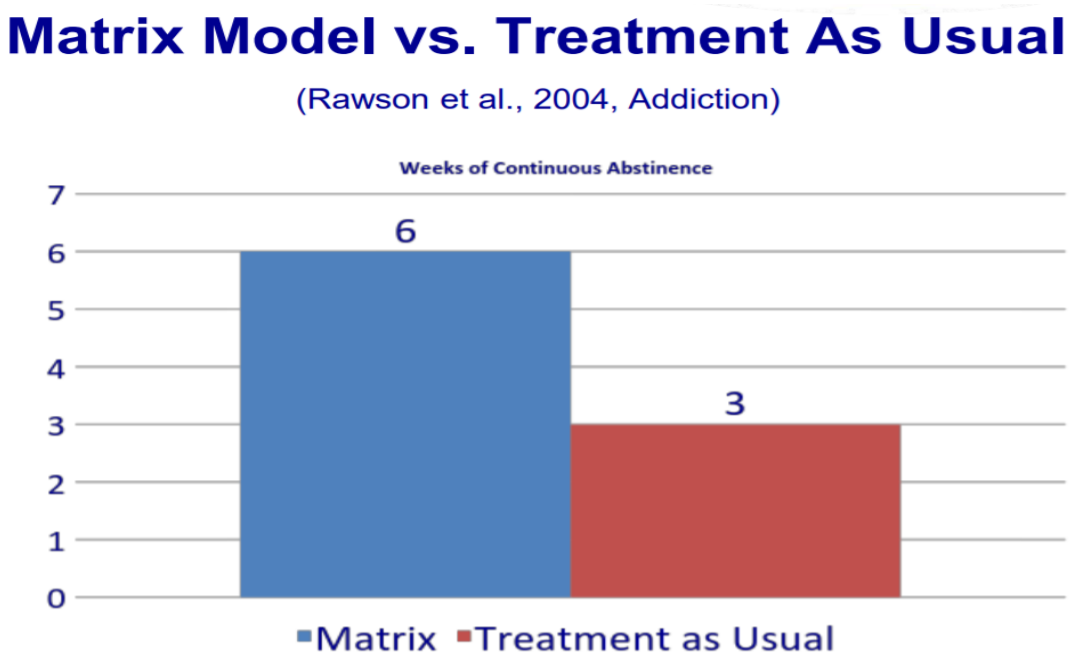
Implementing the components of MMT involves the gathering of eight group-therapy sessions with an emphasis on early recovery skills (ERS) which should be completed during treatment's first month. Focused on recovery, the ERS group promotes awareness and education instead of traditional therapy. Additionally, ERS groups focus on two primary dimensions. The first involves the client's understanding that abstinence and relapse prevention methods are often strengthened by the ERS group members working together to help each other. The second factor is to remind the client that while individual treatment may be supportive, it is the community-based group which will help the person maintain lasting recovery from SUD.

Many researchers note MMT has been successful in treating SUD cases over the past few decades. Eghbali et al. (2013) noted the MMT program for treating SUD has been effective; participants in matrix group interventions have been successful in increasing compliance with treatment, reducing instances of relapse, reducing feelings of anger, anxiety, and depression, increasing treatment maintenance, and assisting patients with maintaining individual pharmacological treatment plans. Researchers also noted Matrix Model-based group interventions increased treatment efficacy using methadone by reducing relapse cases and promoting continuous and regular SUD treatment. Additionally, the use of technology, such as tele-health services (increasingly in use due to the global-reaching COVID-19 pandemic and other related public health concerns), can add additional benefit and increase success rates for the

effective MMT program when implemented in the treatment of Veterans. Follow-on treatment with the MMT program can be integrated electronically with clients communicating from remote areas while avoiding relapse to SUD (Langarizadeh et al., 2017). Aryan et al. (2020) also noted MMT implementation, combined with proper prescription medication, over a 12-week period demonstrated beneficial effects on patients' addiction cravings, severity, and relapse rates.

Figure 5

Matrix Model vs. Treatment As Usual



Note: Rawson et al. (2004) provided this data which indicate a decrease in relapses and increase in abstinence among those who successfully completed the 16-week MMT model as compared to those who conducted treatment outside of the MMT model.

Baca et al. (2007) revealed tele-health services can act as an extension to the counseling domain supporting conventional behavioral health support services. Langarizadeh et al. (2017) noted tele-health counseling services yield multiple capabilities and advanced technology toward providing interventions which are effective to patients. These tele-communication services can

be supportive of the MMT program during periods of isolation when serving remotely stationed clients. This technology could also feasibly allow the continued use of the MMT program among Veterans in the event of another global pandemic or national emergency requiring restrictions on personal interactions similar to the one experienced during the COVID-19 pandemic.

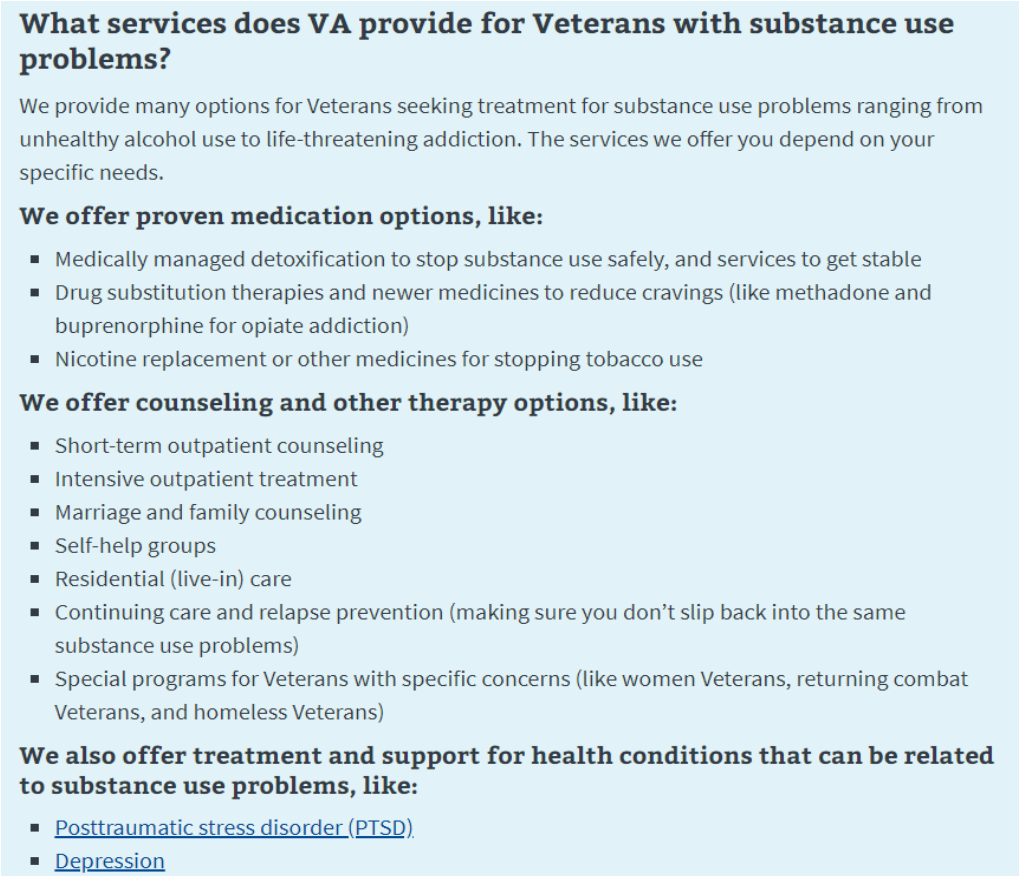
Obert, et al. (2000) applied MMT to treatment settings designed to support patients suffering from stimulant (cocaine and methamphetamine) abuse with notable success. MMT was also successful with treating patients diagnosed with SUD and addiction to other illicit substances. Eghbali et al. (2013) noted MMT was successful during treatment studies with people who suffered from opioid addictions. MMT has also received international consideration and support as a treatment method. Taymoori and Pashaei (2016) were able to demonstrate positive and successful results when applying MMT as a treatment method for patients suffering from methamphetamine abuse in Iran. Traditional methods of treatment approved by the DVA can potentially be enhanced by the integration of MMT for treating Veterans with SUD.

Current DVA Treatment Methods for SUD

The US DVA provides treatment services for Veterans who have been diagnosed with SUD. Currently, the DVA does not provide direct access to the 16-week MMT program. It does provide other treatment services, such as short-term outpatient counseling, intensive outpatient treatment, marriage/family counseling, and self-help groups. The DVA does not currently offer all of these programs at all of their facilities to Veterans. The reasons why whether these programs are not provided simultaneously in an integrated setting is unknown. Further study should be conducted to determine the reasons for this lack of access to all Veterans conducting SUD treatment, regardless of their physical locations.

Figure 6

Current SUD Treatment Services Provided by the US DVA



What services does VA provide for Veterans with substance use problems?

We provide many options for Veterans seeking treatment for substance use problems ranging from unhealthy alcohol use to life-threatening addiction. The services we offer you depend on your specific needs.

We offer proven medication options, like:

- Medically managed detoxification to stop substance use safely, and services to get stable
- Drug substitution therapies and newer medicines to reduce cravings (like methadone and buprenorphine for opiate addiction)
- Nicotine replacement or other medicines for stopping tobacco use

We offer counseling and other therapy options, like:

- Short-term outpatient counseling
- Intensive outpatient treatment
- Marriage and family counseling
- Self-help groups
- Residential (live-in) care
- Continuing care and relapse prevention (making sure you don't slip back into the same substance use problems)
- Special programs for Veterans with specific concerns (like women Veterans, returning combat Veterans, and homeless Veterans)

We also offer treatment and support for health conditions that can be related to substance use problems, like:

- Posttraumatic stress disorder (PTSD)
- Depression

Note: The US DVA website (DVA, 2023) references the treatment services listed above for Veterans diagnosed with SUD. It does not currently offer the 16-week comprehensive MMT program nor does it offer one of MMT's components, the 12-step program.

Residential Rehabilitation Treatment Program

The DVA also offers the Residential Rehabilitation Treatment Program (RRTP) at some of its locations. RRTP is provided in a residential environment with 24/7 support during SUD Treatment and is a 28-day residential rehabilitation treatment program. Neither the 16-week MMT program nor the 12-step recovery program are offered through the DVA's RRTP model..

Intensive Outpatient Program

The DVA also offers the intensive outpatient treatment program (IOP) as an option for Veterans diagnosed with SUD. According to McCarty et al. (2014), IOPs are designed for individuals with SUDs who do not qualify for inpatient or residential SUD treatment or for patients released from 24-hour care at an inpatient medical facility and require additional support. While IOP services offer a minimum of 9 hours of service per week in three separate 3-hour sessions for 90 days, McCarty et al. (2014) posited many programs have been known to be less intensive in the fullness of the program's time. At this time, there is little research to show the effectiveness and success rates of Veterans who have participated in any of these programs currently provided by DVA.

Summary of the Literature Review

The literature review for this project has provided multiple references to scientific studies and research articles focused on SUD, Veterans, and current treatment options currently both provided and denied to them. Particularly, Teeters et al. (2017), Decker et al. (2017), and Betancourt et al. (2022) highlighted the critical problems Veterans face as their SUD relapse rates are increasingly high. Eghbali et al. (2013), Wüsthoff, et al. (2014), Aryan et al. (2020), and Ray, et al. (2020) suggested integrated SUD treatment models, such as MMT, have been highly successful with non-veteran and civilian medical communities. Since researchers note relapse rates are increasingly high among Veterans both during and after SUD treatment, it is suggested integrated treatment models (such as MMT) will help reduce relapse rates among Veterans as evident with non-veteran communities.

One of the key purposes of this study is to generate and provide information on current research, advances, sustainment, and increasingly successful patient responses from the

implementation of combined psychosocial SUD treatments. As these combined treatment methods have been available to non-veterans, Veterans and military family members who are recovering from SUDs could potentially benefit as well. The intent is to help reduce and ultimately end otherwise high rates of relapse following SUD intervention, treatment, and long-term management through combined treatment methods as suggested in previous studies (Jhanjee, 2014).

Research has shown MMT is gaining support as an effective healthcare response for SUD across multiple spectrums of treatment in various civilian treatment centers. Because relapse rates are high among Veterans seeking SUD treatment, it is suggested they be provided with information on additional methods not presently afforded to them. Veterans should be surveyed anonymously to determine their thoughts, interests, and beliefs on current models provided to them, as well as their thoughts and interests in trying other methods not available or denied to them. US military Veterans may demonstrate a majority interest in receiving treatment through the MMT model and other integrated treatment programs. Very little research exists to demonstrate potential interest and support for this treatment program in the US Veteran community. Answering this question should clarify the need for combined treatment methods and will also assist military Veterans as they attempt to maintain sobriety and avoid relapses.

Chapter 3

Methodology

Introduction

This chapter presents information and highlights the philosophical outline and basis of this project's research. It also details the specific research design choices which were essential to the project's validity. Further, it provides specific guidance on how this project was designed and the justification for the design choices. Finally, this chapter comprehensively describes and justifies all related research design choices. This chapter also details the quantitative research conducted, how the data was generated and collected, how the data was analyzed, and the number of anonymous Veteran participants for the surveys.

Research Design

One of the applicable methods of data collection referenced by Joyner et al. (2018) is "*Quantitative Primary, Quantitative First*." In this model, quantitative data is collected based on the answers from participants. The study design and method for this project was a quantitative cross-sectional survey, where the responses were used to interpret quantitative results.

After review for appropriateness to the project's research questions, a cross-sectional study was preferred as an efficient and relatively quick study design option. While completing survey analyses, a cross-sectional study design was a representation of the specific population (Veterans diagnosed with SUD). While measuring and reviewing the responses of different age groups, a cross-sectional study was beneficial to time requirements over a longitudinal study.

This cross-sectional study used some experimental approaches such as anonymously receiving information from participants. This cross-sectional study design effectively functioned using less-intensive data collection methods. The project also included the use of survey

collection from qualified Veteran participants, the use of archival data noted in the literature review, and other related scientific material. Traveling to distribute the project's information and survey opportunities to various Veteran organizations (throughout the state of Florida and within the University of South Dakota) also demonstrated a broader and more diverse population could be reached.

Using a cross-sectional design, multiple variables presented by Veterans were reviewed and analyzed in one setting. For example, this cross-sectional study collected data on a range of attributes in one instance through the online format of the survey; the Veterans' genders, ages, SUD diagnoses, employment status, current interest levels in SUD treatment, etc. The researcher did not impose any personally-identifiable information requirements toward the Veteran participants for this study. Instead, the results came anonymously from surveys completed by Veterans who received survey information at facilities exclusive for Veteran participation and use.

As suggested by Babbie (2010), there were several characteristics necessary for properly conducting this quantitative research study using descriptive statistical analysis:

1.) The research data was gathered from Veterans by using structured research surveys.

2.) The results were based on sample sizes representative of the population.

3.) This research study for US military Veterans and SUD treatments can easily be replicated/repeated, and it sustained high reliability.

4.) This project sustained clearly defined research questions to which objective answers were sought.

5.) All aspects of the study were carefully designed before data was collected.

6.) Data was in the form of numbers and descriptive statistics, and was arranged in tables, and other non-textual forms for review.

7.) This research project was used to generalize concepts more widely, predict future results, and potentially investigate causal relationships.

Rationale

This study was designed to advance SUD research for the US Veteran community, particularly for those who may be suffering from daily misuse/abuse. It was also essential since it provided new opportunities for educating Veterans (and counselors alike) about combined methods of treatment and family/significant other involvement. It also added to the healthcare-focused conversation about positively improving the lives of Veterans as they transition away from the military and into productive lives as civilians. After personally observing high relapse rates among fellow Veterans (both as a US Soldier on Active Duty and as a behavioral health intern/counselor for three civilian hospitals), it was decided to determine if relapse rates currently remain high among Veterans anonymously surveyed for the project. These personal observations led to a careful review of several scientific journal articles which also indicated relapse rates remain high among Veterans suffering from SUD. Finally, this study was designed to help Veterans determine if diverse, collective, and more-involved treatment methods are appealing to them for their diagnoses with SUD.

In order to fulfill this project's goal and answer the research question, quantitative methods of analysis were appropriate based on the analysis of literature from related SUD and treatment topics. Kolodziej et al. (2012) also posited a series of surveys with those diagnosed with SUD may be used to gather information on the effectiveness of their current treatment methods as well as gather interest levels in for other potential models of care. This method allowed researchers to observe, analyze, and possibly understand the success/failure rates of current treatment methods as well as gauge potential interest in new methods such as MMT.

SAMHSA (2012) indicated collected feedback and other forms of data from people diagnosed with SUD would provide significant benefit to understanding their current needs, beliefs, and interests. This assisted researchers with the goal of understanding the relationship of their current beliefs and feelings about current treatment from DVA as well as their interests in trying new programs such as MMT.

Research Subjects

Veterans are important people within the healthcare patient system since they have endured considerable difficulties, stress, and made selfless sacrifices and contributions in the interest of national security (Segerman, 2019). Zucker et al. (2004) noted the DVA research program has transformed over the years into a strong funding vehicle for healthcare research projects resulting in multiple key contributions to medicine and systematic improvements to treatments for patients. It is believed the Veteran population provided quality information on current treatments in place for those diagnosed with SUD, and it is also believed their contributions helped determine interest in implementing the MMT program into the DVA healthcare system.

Inclusion/Exclusion Criteria

Qualifications for participation in this Research Study must include the following:

1.) The participant was officially recognized by the US Department of Defense and/or US DVA with Active, Reserve, National Guard, and/or Veteran status.

2.) The participant was at least 18 years of age.

3.) The participant used/misused substances (alcohol/drugs) and was diagnosed with SUD.

4.) The participant has received treatment pertaining to substance use.

5.) The participant was willing to fill out the survey voluntarily and anonymously.

Sample Size

The project's goal was to collect 200 surveys from qualified Veteran participants. This sample size is based on Slovin's Formula (Figure 7). According to the Department of Veterans Affairs (2021), there are approximately 1,492,000 Veterans in the State of Florida. Within this population, there are 1,328,000 male Veterans and 164,000 female Veterans. The American Legion, Department of Florida currently has over 130,000 Veterans enrolled in the organization with more than 300 Legion Posts across the state (American Legion, 2022).

For the State of South Dakota, there are approximately 60,330 Veterans (Department of Veterans Affairs, 2021). According to the University of South Dakota's Office of the Registrar (2022), there are approximately 210 student Veterans presently enrolled in the DVA's Government Issue (GI) Bill education program within the school.

Figure 7

Slovin's Formula for Use in this Study

$$n = \frac{N}{1 + Ne^2}$$

Note: By using Slovin's Formula (shown above), $n = N \div (1+Ne^2)$ where n = Number of samples, N = Total population, and e = Error tolerance.

Recruiting Procedures

The project conducted a sampling of convenience since the researcher attended USD while residing and working in Florida. These surveys were distributed using nonrandom sampling strategies to obtain the combination of characteristics (e.g. Veteran status, SUD diagnosis, current treatment methods, etc.) essential to the research study. The goal was to have Veterans self-identify as being diagnosed and receiving treatment for SUD. The Veterans were

then empowered to relay information regarding their experiences with SUD treatment methods and potential interests in MMT.

Participants were recruited using two different primary methods; 1) through outreach to multiple Veterans' organizations and groups such as the Veterans of Foreign Wars, American Legion, and several other exclusively recognized and accredited State/National Veterans organizations across the state of Florida. 2) anonymous emails to student Veterans through the University of South Dakota Student (USD) Veteran Resource Center.

Regarding the Florida Veteran population, a project goal was to find different groups of Veteran participants. The varied demographics, backgrounds, and amounts of responses from the Veterans at the American Legion and Veterans of Foreign Wars posts throughout Florida were of great benefit since their answers came from a large spectrum of perspectives. For example, Veterans in Tallahassee could have different responses and answers to the surveys than Veterans in Tampa. The purpose of requesting access to official/accredited Veterans organizations was to help guarantee actual Veterans are the qualified participants.

Over 40 different Veteran organizations were contacted for support with this project, and the majority of these organizations were located in various parts of the State of Florida. Table 1 describes the Veteran organizations which were individually contacted for assistance, review, and distribution support with the anonymous surveys to Veterans. These organizations' representatives were supportive and receptive to the project, and indicated they would help disseminate information to potential Veteran candidates for participation. Transparency and openness were important to this study, and the researcher helped build trust and confidence with other Veterans by sharing the study's purpose and goals. The participants also had access to a

summarized bio-sketch of the researcher to help them understand the awareness, experience, and background information important to this project.

The largest Veteran organization contacted for support was the American Legion, which provides over 300 facilities within the State of Florida for potential dissemination of information to local Veterans. For the American Legion, 23 of the organization's 300 posts in Florida were directly contacted and visited for support, and these facilities were located in multiple towns and cities throughout the state to include Tampa, Clearwater, Saint Petersburg, Tallahassee, Orlando, Lady Lake, Jacksonville, Lakeland, Fort Myers, Sarasota, Clermont, Venice, and many others. The Veterans of Foreign Wars organization has 72 posts throughout Florida, and 11 of these facilities were personally visited and contacted throughout the state for support with this project. Additional Veteran organizations in Tallahassee were also petitioned for review and assistance with disseminating this project's information.

For South Dakota, the student Veterans at USD were contacted anonymously through email from the USD Student Veteran Resource Center. Their contributions to and from the student population were important, as was their feedback on current treatment methods provided to them. Many of the student Veterans at USD are from a younger demographic, as compared to many of the other Veterans in the state. The staff at the USD Student Veteran Resource Center indicated they require full approval from the Institutional Review Board (IRB) at USD's Office of Human Subjects Protection prior to sending any emails or surveys to the student Veterans in their database. With the IRB's approval, the Veteran Resource Center staff sent out the emails to the student Veterans. Ultimately, 210 anonymous Student Veterans directly received survey access information from the USD Student Veteran Resource Center for their potential participation. These Student Veterans received an email within their secure student accounts

providing a summary of the project, an explanation of why their participation is important, and the hyperlink to the anonymous survey provided through secure software.

Table 1

Description of Veteran Organizations Contacted to Generate Veteran Participation in Surveys

Name of Veteran Organization	n	%
The American Legion (Posts throughout Florida)	23	56%
Veterans of Foreign Wars (Posts throughout Florida)	11	27%
Florida Veterans Foundation	1	2%
Veterans Florida	1	2%
Vietnam Veterans of America	2	5%
Leon County Veterans Services	1	2%
Tallahassee Veterans Center	1	2%
The USD Student Veteran Resource Center	1	2%

Survey Development and Implementation

This series of survey questions exclusive to veterans diagnosed with SUD helped produce data to determine whether Veterans with SUD are interested in trying MMT as a treatment method for SUD. The survey was made available online using Qualtrics software (https://www.qualtrics.com). The survey was available via online hyperlink and QR Code, and access to the survey was shared with Veterans who may be eligible for participation (located here: Edit Survey | Qualtrics Experience Management).

Survey Question Development

The survey contained 27 questions relevant to this project. The Likert Scale was used for question development. Through this scale, the list of operationalized concepts were generated to

organize most of the Veterans' responses toward current treatment programs as well as gauge their interests in using the MMT model during treatment. Specific guidance was provided to each participant prior to the beginning of the survey questions including the voluntary nature of participation.

Specific criteria were used as questions were formulated. The first several questions were generated to determine socio-demographic data of the Veteran participants. The second set of questions were selected to answer research questions based on Veteran feelings, thoughts, and opinions on their current SUD treatments. These questions were also based and created from the findings and research of other published studies noted in the literature review. Since several previous research studies noted high relapse rates among Veterans conducting SUD treatment, several of this project's questions were focused on relapse rates as well as overall opinions on their provided treatments.

After answering questions on their current treatments, Veterans were provided with a web-page of information on the MMT integrated treatment model. The following third set of questions were focused on Veteran feelings, attitudes, and beliefs toward trying other SUD treatments such as the MMT program. The final set of questions focused on Veteran feelings and beliefs overall on their SUD treatment programs, and also provided an open opportunity to write specific comments and feedback on the project, their treatments, or any other consideration they wanted to clarify.

Several subject matter experts and other healthcare professionals on SUD treatment were consulted during question development, and their supportive feedback and suggestions were implemented into the project's surveys. Previous studies, as referenced in the literature review, were also carefully reviewed for relevance while developing the questions for the surveys to the

Veterans. Questions pertaining to DVA actual/recognized Veteran status, current SUD diagnosis, previous treatments received, current treatments received, MMT program interest, significant other/family involvement in the treatment process, and many other related questions were present on the surveys.

The survey designs and questions for Veterans were completely original, and they were created using multiple scientific principles combined with a Veteran's point of view. The surveys contained a series of questions with multiple choice responses, and also contained several Likert scale ratings to determine their current thoughts, feelings, and beliefs on current treatment and also determine their interests in trying the MMT program. A section was also provided for Veterans to write comments with direct feedback on their assessments of current treatment and MMT.

Protection of US Veteran Participants

This project was first reviewed and approved by the University of South Dakota's (USD) Institutional Review Board (IRB) before proceeding toward any contact with Veterans or Veteran organizations. Its full contents were formally presented to and approved by the IRB under project identification number 22-133. The Association for the Accreditation of Human Research Protection Programs, Inc. (AAHRPP) accredits the USD IRB for demonstrating proper research participant safeguards to fully meet and strictly adhere to both state and federal requirements. The USD Human Subjects Protection Program has maintained full AAHRPP accreditation since 2005. The USD Office of Human Subjects Protection continues to remain dedicated to ensuring the rights, privacy, welfare and safety of human subjects participating in research under the review of USD. All human subjects research for USD was in full compliance with federal regulations.

The USD IRB is an academic affiliate IRB for the DVA, as well as the Royal C. Johnson Veterans Memorial Hospital and Regional Office Center (Sioux Falls, SD) and Veterans Administration Medical Center (Fargo, ND). This research project complied with all ethical principles and protection of human subjects as outlined in Title 21 (Title 21: Code of Federal Regulations, 2020). All participants were provided with informed consent which detailed the goals and aims of the project. Participants understood any related benefits and risks associated with project participation. Additionally, participants were provided details on how the project's generated information is reviewed and recorded (Title 21: Code of Federal Regulations, 2020). Anyone participating in the study did so strictly as a volunteer and was allowed to halt/leave the survey at any time for any reason (Title 21: Code of Federal Regulations, 2020). All participants were given the opportunity to review recorded copies of the completed research project via electronic access. All data collection was carefully monitored to ensure adherence to USD research requirements and ethical methods were consistently applied to facilitate Veterans' confidentiality, privacy, and anonymity.

Description of the Methods of Analysis

The researcher conducted an analysis of the digital responses from Qualified Veteran participants in relation to the thoughts and feedback of their current dispositions, treatment responses, and other related feedback. Once this analysis was completed, the study's results were cross analyzed to compare the Veterans' varied responses. The concepts outlined in descriptive statistical analysis allowed the in-depth and detailed reviews of feedback from Veterans, and the effects of current practices as well as gauging interest in additional models (such as MMT) for the treatment of SUD. Anonymous survey information and data were generated, provided, and stored using encrypted digital software provided by Qualtrics. The secure data generated from

Qualtrics was also encrypted for transfer to Statistical Package for the Social Sciences (SPSS) software for data tabulation and cross-sectional analysis. All tables were generated using Microsoft Excel software.

Outcomes are believed to have corresponded to the specific aims of this project. The Specific Aims, as referenced earlier for this project, were as follows:

Specific Aim 1: Assess current treatment (satisfaction ratings) for Veterans suffering from SUD and determine satisfaction with current treatment provided by the DVA.

Specific Aim 2: Determine whether a combination of psychosocial treatments, using the MMT program, would be considered and accepted by Veterans in treatment for SUD.

To assess if the majority of Veterans (50% or more) disagree with the overall question on treatment effectiveness, confidence intervals for proportions were used. If the researcher could rule out disagreement of 50% or less, then the researcher considered that the majority of Veterans disagree with the concept of their current treatment being effective. This assessment was completed using a 95% confidence interval (CI) based on the exact method for proportion. The expectation was that the lower limit of the 95% CI will be above 50%, this ruling out lower levels of disagreement.

If it can be confirmed that the majority of Veteran participants (50% or more) indicate they do not believe current forms of SUD treatment are effective with their conditions, then this information would be helpful to note additional treatment options (such as MMT) should be considered for use by the Department of Veterans Affairs' Healthcare System. This will help with Specific Aim 1. Additionally, if the majority of Veteran participants (50% or more) indicated positive interest in trying the MMT System as an official treatment option for SUD, then Specific Aim 2 will be met. Similar to the disagreement with treatment effectiveness, the

assessment was completed using a 95% confidence interval (CI) based on the exact method for proportion. The expectation was that the lower limit of the 95% CI would be above 50%, thus ruling out lower levels of agreement. This information was also helpful to note MMT as a potential treatment option for consideration and implementation by the DVA Healthcare System.

In addition to confidence intervals for the main outcome questions of interest, the survey questions were also analyzed to further assess the effectiveness of current treatment and the interest in the MMT model.

Statistical analysis began, using the following steps and review process:

1.) Descriptive Statistics, frequency, and proportion for each question were calculated. The Likert Scale categories helped the researcher identify and know the beliefs of Veterans on both current treatment programs as well as the possible interest (inclination, neutrality, and disinterest) toward implementing MMT into their treatment settings. When analyzing Veteran satisfaction levels with current treatment methods, these responses were defined by specific levels of interest (satisfied, dissatisfied, and neither satisfied nor dissatisfied). Veterans were defined as having these responses or not, based on the definitions ($\hat{p}= x/n$).

2.) A comparison of the scores, based on different demographic characteristics, was conducted using chi-squared tests to determine possible differences in treatment effectiveness and/or interest in MMT for different groups of Veterans. Fisher's Exact Test was used for sparse tables when there were cell sizes less than 5. A traditional chi-square test was used when evaluating data, and the Yates continuity correction (chi-square) test was used to compensate for any notable deviation from the theoretical (smooth) probability distributions.

Yate's continuity corrected p-value was also used as appropriate in the final results. Finally, the effect of Yates' correction helped prevent overestimating statistical significance

regarding smaller data sets, since several cells in the tables for Chapter 4 contained multiple counts smaller than 5.

3.) The researcher generated a logistic regression model to assess multiple demographic factors (marital status, gender, etc.) for determining differences in treatment effectiveness (by those demographics) and reported MMT interest levels. This analysis helped identify possible combinations of characteristics of those participants which are not benefiting from current treatments as well as a group of individuals who might be particularly interested in the MMT model and system of treatment. Particularly, logistic regression helped model the probability of discrete outcomes (Veteran interest levels) given the input variable (Veteran feedback). For this project, logistic regression models demonstrated binary outcomes. This included two values inputted from Veteran surveys, such as interested/disinterested, yes/no, and so forth. The dependent variable referenced Veterans who relapsed to substances in 90 or less days during/after SUD treatment, and the independent variables are the Veterans' satisfaction ratings with the DVA, the length of time each Veteran conducted SUD treatment, the amount of time each Veteran struggled with SUD prior to seeking treatment, the Veterans' overall DVA Treatment Rating, and individually reported marital status.

Limitations and Delimitations of the Project

The limitations of this research project's design (using electronic surveys) included surveying Veterans only from within the state of Florida, and also dissemination of these surveys to student Veterans currently enrolled in at USD. This may have lead to the surveys being limited in generalizability to the Veteran populations within Florida and South Dakota. However, the implementation and use of electronic surveys allowed qualified Veterans to participate from remote locations across the United States. Another limitation of this project

was proper outreach and communication with Veterans due to the spread of COVID-19. The COVID-19 Pandemic created sweeping impacts and effects on hospitals and clinics across the nation, which often create considerable difficulties with making direct contact with the Veteran populations. The use of electronic surveys helped alleviate this loss of direct contact.

An additional concern wass this project did not utilize the direct support of DVA staff and counselors who could potentially have direct influence on Veteran participation. This inability to sustain direct contact with DVA staff was due to the COVID-19 impacts which have led to many DVA service facilities, hospitals, and clinics to be closed until further notice. A potential solution to this difficulty was to contact additional non-DVA civilian medical and healthcare staff (operating at additional hospitals, clinics, and rehabilitation facilities) for support with qualified Veteran participant recruitment and survey dissemination.

Methodology Conclusion

The purpose of this research study was to assess current treatment for SUD and determine interest and support for the MMT program among US military Veterans diagnosed with SUD. By use of Slovin's Formula, an adequate number of qualified participants were determined. While understanding and working through the COVID-19 epidemic, Veterans were contacted for support through their participation in electronic surveys since in-person direct contact was often disallowed for health and safety reasons. Once the surveys were collected, descriptive statistics were used to review, record, and analyze Veteran responses to determine current satisfaction levels of DVA treatment programs and additionally determine Veteran interest in implementing the MMT program with them for SUD treatment.

This research project was focused on assessing the interests toward the MMT program for Veterans since the DVA does not currently use this system of treatment. It was believed

interest would be strong enough (over 50% positive interest) to merit supporting its consideration with formal administrative channels at the DVA. Participants included individual Veterans with a previous diagnosis of SUD. This comprehensive project was focused on distributing surveys to qualified participants, recording, and analyzing data, publishing the results, and gauging US Veterans' interests, impacts, and experiences regarding the MMT program.

Chapter 4

Results, Findings, and Analysis of Data

Introduction

The primary focus of this research study was to examine the current satisfaction levels of United States Military Veterans (Veterans) who received medical treatment after a previous diagnosis of SUD. The secondary focus was to provide information on the Matrix Model of Treatment (MMT) and determine Veteran interest levels in trying MMT as a 16-week healthcare program for their SUD diagnoses. Statistical analysis of Veteran responses for this project yielded results which are supported by other scientific studies.

The main purpose of this chapter is to include a description of the research-based findings and demonstrate the statistical methods as they were applied to the information collected from the surveys. Scientific tables, graphs, charts, and other depictions of data are detailed for discussion. The project's findings are also reviewed through the use of regression models and statistical analysis, which include varying interpretations of the collected information. This statistical process can be replicated in future studies, and is encouraged since it will provide additional and current feedback, thoughts, and insights from Veterans who struggle with SUD.

Research Questions

The primary research question for this project is as follows: "Are Veterans, who have been diagnosed with SUD, satisfied with current treatment methods provided by the US DVA healthcare system?" The secondary research question for this project is, "Once Veterans receive information on MMT for SUD treatment in the civilian population, will a majority of surveyed Veterans demonstrate positive interest in this treatment program?"

Research Hypotheses

Alternative. After reviewing material explaining the use of the MMT program in the civilian population, interest in the MMT program will be generally positive among over 50% of SUD-diagnosed Veterans surveyed.

Null. After reviewing material explaining the use of the MMT program in the civilian population, interest in the MMT program will be generally positive among less than 50% of SUD-diagnosed Veterans surveyed.

After careful and thorough analysis and tabulation of the survey data from Veteran participants, the alternative hypothesis was found to be true. Over 50% of the responding and qualified participating Veterans demonstrated positive interest in the MMT program. The null hypothesis can be rejected as the results demonstrated the alternative hypothesis as true and accepted for the project.

Results of Survey Responses

While the original project goal was to receive surveyed feedback from 200 qualified Veterans, a total of 152 Veterans accessed the surveys for this study. The researcher personally traveled, visited, coordinated, and re-visited with over 40 different Veteran-based organizations to ensure as much participation with this project as possible. The online survey was closed after 85 consecutive days of distribution, dissemination, access, and reception of Veteran feedback and after the Veteran organizations were canvassed and petitioned for consideration, support, review, and assistance with the project. Based on the breadth and length of distribution it was decided that few additional responses would be forthcoming and that the study had likely reached saturation among the Veterans that had been approached.

The decision to close the project's survey was also based on additional factors including overall Veteran interest in discussing their behavioral health concerns through anonymous surveys and ensuring the survey information and access hyperlink were continuously available to them. Additionally, the survey was closed after consistently communicating with the Veteran organizations' leaders for potential follow-up questions and continuing to request interest and attention to a research project which Veterans may have possibly diminished interest in participating with the fullness of time.

After closely inspecting all 152 recorded responses, 2 were flagged as potential spam, 5 lacked a substantial amount of information and were not finished, and 10 were automatically disqualified for indicating the participating Veteran did not have a medical diagnosis for SUD. After these 17 invalid responses were properly discarded, the final count for completed surveys from qualified Veterans was 135. The data and information from these 135 participants were provided for statistical analysis in this project. Their information was received anonymously, and is considered valid, secure, and appropriate for research purposes. Additionally, no Personally-Identifiable Information was received from participants at any time in their completions of the surveys.

Sociodemographic Characteristics of the Participants

The sociodemographic information provided by participating Veterans was varied. A summary of the sample population detailed on Table 2 depicts the demographic data reported from the participating Veterans. In terms of demographics, most participants (41%) were aged 18-39 years, 84% were male compared to 16% female, about a third (34%) of participants identified as single/never married. In terms of education status, (42%) had a high school diploma and 36% had some college-level education but no diploma. Additionally noted,

employment demographics indicated 34% of the participants were employed and 20% were students and not employed.

Table 2

Sociodemographic Characteristics of 135 Veteran Participants

Age	*n*	%
18-39 Years Old	56	41%
40-64 Years Old	46	34%
65+ Years Old	33	24%
Gender	*n*	%
Male	114	84%
Female	21	16%
Racial Identity	*n*	%
American Indian or Alaska Native	1	1%
Asian American	4	3%
Black or African American	15	11%
Hispanic or Latino or Spanish Origin	18	13%
Multiple Races	16	12%
Native Hawaiian or Other Pacific Islander	1	1%
Other	1	1%
White or Caucasian American	79	59%
Marital Status	*n*	%
Single or Never Married	46	34%
Presently Married or in a Domestic Partnership	42	31%
Separated	13	10%

Divorced	26	19%
Widowed	8	6%

Sociodemographic Characteristics of 135 Veteran Participants

Education Status	*n*	%
High School Diploma / General Education Development Certificate	57	42%
Some College/Trade/University Courses Completed; No Degree Yet	48	36%
College, Trade, or University Degree	25	19%
Graduate or Advanced Degree	5	4%
Employment Status	***n***	**%**
Currently Employed	46	34%
Currently Unemployed, but Looking for Work	18	13%
Currently Unemployed, and Not Looking for Work	2	1%
Currently Disabled and Not Able to Work	14	10%
Retired	22	16%
Currently a Student and Employed	6	5%
Currently a Student and Not Employed	27	20%

Veterans' Reported Satisfaction Levels with Current SUD Treatment

Of 135 valid surveys from Veterans, 69.6%, 95% CI [61.1%-77.2%] reported they are neither satisfied nor dissatisfied with their current SUD treatments. A majority, 80.1%, 95% CI [73.1%-87.0%] of the surveyed Veterans reported they relapsed to a substance use/misuse condition within the past 90 days. Regarding the amount of time which participating Veterans have been receiving or have received professional treatment for SUD, 68.2%, 95% CI [59.6%-75.9%] indicated they had received 12 or less months of treatment. Veterans reported

their SUD struggles prior to seeking treatment, and a considerable proportion (36.3%, 95% CI [28.2%-45.0%]) noted they struggled for 5+ years (Table 3A). A chi-square test of independence was performed to assess the relationship between the amount of time they struggled with SUD prior to seeking treatment and the amount of time they received treatment (Table 3B). The relationship between these variables is statistically significant, $X^2(4) = 29.55$, $p < .0001$.

Table 3A

Evaluation of Current SUD Treatment Compared with Time of Prior Struggle with Substances

Time Struggling with SUD Prior to Treatment	*n*	%
12 Months or Less	41	30%
1-4 Years	46	34%
5+ Years	48	36%
Amount of Time Reported in Treatment Settings	***n***	**%**
12 Months or Less	92	68%
1-4 Years	26	19%
5+ Years	17	13%

Table 3B

Evaluation of Current SUD Treatment Compared with Time of Prior Struggle with Substances

Time in Treatment	Struggled < 12 Months	Struggled 1-4 Years	Struggled 5+ Years	Total
< 12 Months of Treatment	37	36	19	92
1-4 Years of Treatment	2	6	18	26
5+ Years of Treatment	2	4	11	17
Total	41	46	48	135

$p < 0.001$

The amount of time Veterans struggled with SUD prior to seeking medical treatment is greater than the amount of time spent in treatment, and it is important to note 49.0%, 95% CI [40.2%-57.6%] indicated they were neither satisfied nor dissatisfied with medical treatment (after 12 or less months in treatment), and 11.9%, 95% CI [6.93%-18.5%] were dissatisfied after 12 or less months of medical treatment. Only 8.0%, 95% CI [4.1%-14.1%] of the participating Veterans reported they were satisfied after 12 or less months of DVA treatment. Regardless of their time in SUD treatment, 22.2%, 95% CI [15.5%-30.2%] of Veterans were dissatisfied. When reviewing the Veterans' overall satisfaction levels of SUD treatment across all lengths of time and comparing the data on the lengths of time provided for SUD treatment there was not a statistically significant relationship (p=.18). However, the high response from Veterans reporting they are neither satisfied nor dissatisfied is important to note when data pertaining to the Veterans' increasingly high relapse rates are compared with their ratings of DVA-provided treatment. This basic indifference to treatment reported by Veterans could be considered as not good when they are relapsing back to substances at a higher rate either during or after their treatment is completed.

Table 4

Evaluation of Current SUD Treatment Received and Compared with Satisfaction Ratings

Time in Treatment	Dissatisfied	Neither Sat/Dissatisfied	Satisfied	Total
< 12 Months Treatment	16 (12%)	66 (49%)	10 (6.5%)	92
1-4 Years of Treatment	9 (7%)	16 (12%)	1 (0.5%)	26
5+ Years of Treatment	5 (4%)	12 (9%)	0 (0%)	17
Total Responses	30 (23%)	94 (70%)	11 (7%)	135

The relationship between Veterans struggling prior to seeking treatment and the time/amount of treatment received may also be important when observing only 8.0%, 95% CI [4.1%-14.1%] of participants were satisfied with current treatment and a majority 80.1%, 95% CI [73.1%-87.0%] of the surveyed Veterans indicated they had relapsed back to substance use within the past 90 days. In terms of Veteran feedback on SUD treatment effectiveness, 30.0%, 95% CI [22.8%-38.9%] indicated their treatment was not effective, 50.0%, 95% CI [41.6%-59.1%] noted their treatment was somewhat effective, and only 20.0%, 95% CI [13.6%-27.8%] reported that their treatment was very effective.

When comparing Veterans' high relapse rates with their ratings of effectiveness of SUD treatment, there was not a statistically significant relationship ($p = .15$), Yates' P-Value for this set of data was 0.03. Yates' P-Value is applicable since several cells in Table 5 contained multiple counts smaller than 5. With Yates' P-Value at 0.03, it is possible there is a significant relationship between reported relapse rates and their reported SUD treatment effectiveness rates.

It is important to note there may be ambivalence regarding Motivational Interviewing among Veterans in SUD treatment, as this area potentially ties into increasingly high levels of relapse amongst those who are neither satisfied or dissatisfied with their treatment. It is therefore possible and hypothesized that Veterans who are not motivated to attend current SUD treatments may have higher inclinations toward relapses both during and after treatment sessions. Other researchers, as noted in this project's literature review, have noted many Veterans demonstrate an indifference and (in some cases) outright refusal to seek healthcare treatment for medical conditions of any type or form. Additional research is recommended to determine a possible connection between a lack of interest in seeking help and increasingly high relapse rates among Veterans in treatment.

Table 5

SUD Treatment Ratings Compared to Reported Relapse Rates

Treatment Ratings	No Substance Use: 12+ Months	No Substance Use: 3-12 Months	Substance Use in Past 90 Days	Total
Treatment is Not Effective	0 (0%)	3 (2%)	40 (30%)	43
Treatment is Somewhat Effective	2 (2%)	18 (14%)	68 (51%)	88
Treatment is Very Effective	0 (0%)	1 (1%)	1 (1%)	2
Total Responses	2 (2%)	23 (17%)	109 (82%)	133*

*2 participants did not provide answers to these questions.

Table 6 references two variables regarding the evaluation of treatment providers who listen as compared to the perceived gaps between SUD treatment provided/preferred by Veterans. When Veterans were asked if they believe their concerns are listened to and properly acknowledged by their treatment providers, the majority (54.0%, CI 95% [45.3%-62.7%]) indicated they neither agreed nor disagreed, 39.0%, 95% CI [30.9%-48%] indicated disagreement, and 7.0%, 95% CI [3.09%-12.3%] indicated agreement. The P-Value of < 0.001 was determined based on the comparison of treatment providers listening to Veterans and the Veterans' perceived gap in SUD treatment. This indicates a significant relationship between Veterans indicating they are not listened to and Veterans' beliefs about their concerns not being properly addressed. In Table 6, only 7.0% of Veterans reported their concerns are listened to and properly acknowledged by treatment providers, it is important to note any gaps Veterans may be experiencing between current treatment provided to them versus the treatment they prefer and

want to receive. When Veterans noted if there is a gap in received treatment and their preferred treatment, the majority (59.0%, 95% CI [50.5%-67.6%]) indicated there is a gap between them.

Table 6

Evaluation of Treatment Providers who Listen Compared to Gaps Between Treatment Provided/Preferred

Reports of Gaps in Treatment Provided vs. Treatment Preferred	Concerns are Listened To	Neither Agree/Disagree	Concerns Not Listened To	Total
No Gaps Present	3 (2%)	1 (1%)	1 (1%)	5
Sometimes There are Gaps	3 (2%)	29 (21%)	18 (13%)	50
Yes, There are Gaps	4 (3%)	43 (32%)	33 (24%)	80
Total Responses	10 (7%)	73 (54%)	52 (39%)	135
$p < 0.001$				

Veterans' Interest in the MMT for SUD Treatment Programs

When asked, 91.7%, 95 CI [85.7%-95.8%] of surveyed Veterans indicated they would like to have access to MMT as an SUD treatment option. Additionally, 59.0%, 95 CI [49.8%-67.1%] of those surveyed believe other Veterans would benefit from trying MMT as an option to treat SUD (Table 7A). The table below details the information as provided via surveys.

Table 7A

Veteran Interest Levels in Trying MMT vs. Veteran Beliefs on MMT Helping Other Veterans

	Yes	Maybe	No	Total
Would You Like Access to MMT?	122 (92%)	11 (8%)	0	133*
Would Other Veterans Benefit from MMT?	79 (59%)	54 (40%)	0	133*

*2 participants did not provide answers to the questions

Table 7B contains the bivariate analysis of these two questions. There is a statistically significant relationship between whether Veterans would like access to MMT for treatment and their affirmative beliefs on other Veterans benefiting from MMT, Chi Square (1, n = 133) =10.41, p =0.001. Most Veterans (58.6%, 95% CI [49.7%-66.9%] were both interested in trying the MMT and believed it would help other Veterans. This information is detailed on Table 7B.

Table 7B

Veteran Interest in Trying MMT vs. Determining if MMT Could Help Other Veterans

Could MMT Help Other Veterans?	Maybe I Want MMT	Yes, I Want MMT	Total
Maybe it will Help Other Veterans	10 (7%)	44 (33%)	54
Yes, it will Help Other Veterans	1 (1%)	78 (59%)	79
Total Responses	11 (8%)	122 (92%)	133
p < 0.001			

When Veterans were surveyed for their interests in participating in the MMT Model, they were asked which components would be of importance to them. A large majority (80%, 95% CI [72.3%-86.4%]) indicated the Relapse Prevention Groups (RPGs) would be effective in helping a person stay away from using / misusing substances.

The Veterans also responded favorably to the implementation of FEGs with a 64.0%, 95% CI [55%-71.8%] majority. Cross-Tabulation of these two categories yielded a P-Value of 0.0083; a significant relationship exists between Veterans' beliefs that FEGs and RPGs could be more effective in helping a person stay away from using/misusing substances within MMT as a treatment option. Additional research is recommended to determine why Veterans showed such high levels of interest in FEGs and RPGs for their SUD treatment settings.

Table 8

Determining Interest in MMT's Relapse Prevention Groups (RPG) Compared with MMT's Family Education Groups (FEG)

FEG Interest Level	RPG: Maybe	RPG: Yes	Total
FEG: Maybe	4 (3%)	44 (33%)	48 (36%)
FEG: Yes	24 (17%)	63 (47%)	87 (64%)
Total Responses	28 (20%)	107 (80%)	135
$p = 0.0083$			

When asked about their current involvement in the 12-Steps method of treatment (often referred to as the Alcoholics Anonymous or Narcotics Anonymous Treatment Programs), 61%, 95% CI [52%- 69%] of the Veterans indicated this program was not offered to them as part of their treatment. When first answering questions related to current treatment methods, 40%, 95% CI [31.7%-48.8%] of surveyed Veterans indicated they would like to have access to the 12-Steps program. After the survey allowed Veterans to receive and review detailed information on how MMT and the 12-Steps program are implemented together, 73%, 95% CI [65%-80.6%] of the participating Veterans reported they believe the 12-Step Meeting Program could be more effective in helping a person stay away from using/misusing substances.

As mentioned in Chapter 2, the DVA does not currently implement the 12-Steps SUD treatment program for Veteran patients at their medical facilities. From the surveys, a majority belief (73.0%, 95% CI [65%-80.6%] among Veterans favoring the 12-Steps program (within MMT) indicates it could potentially help them in SUD treatment because it shows +50% support for another key component of the MMT program. Table 9 demonstrates this +50% majority

belief in trying the 12-Steps program, even though it is not currently implemented into SUD treatment programs at DVA medical facilities.

Table 9

Determining DVA Offers the 12-Step Model of Treatment Compared with Would the 12-Step MMT Model Help Veterans Stay in Treatment

Could the 12-Step Model Help Veterans?	12-Steps Not Offered	12-Steps Not Offered, but Want to Try it	Total
Maybe it will Help Veterans Avoid Substances	27 (20%)	10 (7%)	37
Yes, it will Help Veterans Avoid Substances	55 (41%)	43 (32%)	98
Total Responses	82 (61%)	53 (39%)	135

Logistic Regression Model

A binary logistic regression was constructed to examine the predictability of relapse rates by treatment satisfaction levels, Veterans' ratings of the VA, treatment length, length of struggle prior to treatment, and marital status. These variables were included in the model because they were potentially connected to the high relapse rates. The logistic regression model assessed a key demographic factor (marital status) for determining differences in treatment effectiveness. Marital status demonstrated a notable trend; Veterans who indicated they are married were more likely to have a relapse than Veterans who are not married. This analysis also facilitated identification of possible combinations of characteristics among Veteran participants who are not benefiting from current treatments.

Particularly, logistic regression modeled the probability of discrete outcomes (Veteran interest levels) given the input variable (Veteran feedback). After reviewing the inputted survey data, the logistic regression model demonstrated binary outcomes. There are two included

values inputted from Veteran surveys, such as interested/disinterested, yes/no, and so forth. The dependent variable referenced Veterans who relapsed to substances in 90 or less days during/after SUD treatment, and the independent variables referenced the Veterans' satisfaction ratings with the DVA, the length of time each Veteran conducted SUD treatment, the amount of time each Veteran struggled with SUD prior to seeking treatment, the Veterans' overall DVA Treatment Rating, and individually reported marital status.

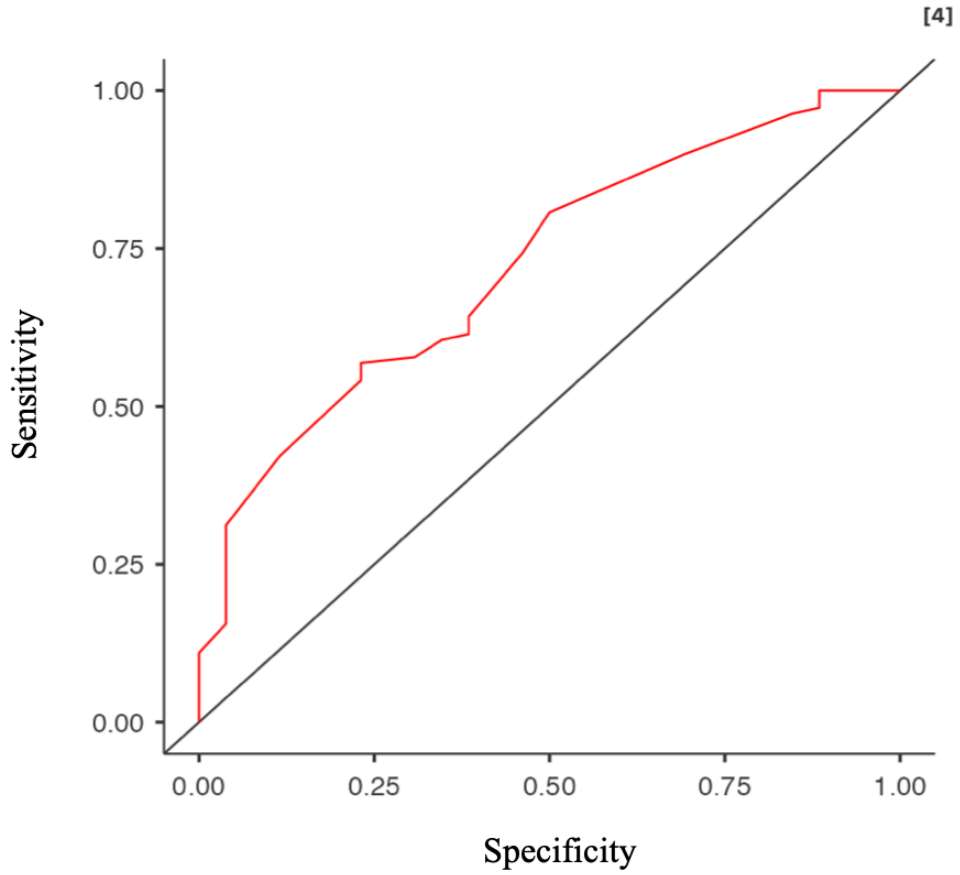
A binary logistic regression model was chosen since the outcome variable was a binary variable. A receiver operating characteristic curve (ROC curve) was reviewed to determine performance of this classification model within all classification thresholds. The overall model was also reviewed and assessed using the Area Under (a ROC) Curve (AUC) measurement, which gives an indication of predictability for the model.

The AUC shows acceptable discrimination (level of predictability, AUC =.72) for the model. See figures 8 and 9 for additional details on predictability. Additionally, the multi-collinearity statistics (VIF and tolerance levels) indicate that the assumption of independent predictors is reasonable for this model.

Relapse rates are included in this model, which were noted as the dependent variable. Treatment Satisfaction Levels were also included (Independent Variable). Marriage status was also classified as an independent variable to this scenario and was included for Veterans suffering from SUD. The Veterans' assessments of DVA Ratings, Treatment Lengths, and Treatment Ratings were also categorized as independent variables.

Figure 8

ROC curve (receiver operating characteristic curve) Graph for Predictability Analysis



Note: The ROC curve in the above graph demonstrates the performance of the classification model at all classification thresholds. The above curve plots two parameters: True Positive Rate vs. False Positive Rate. The AUC value is .72, which is in the acceptable discrimination range between Veterans who relapsed within 90 days and those who did not.

Table 10

The Area Under (a ROC) Curve (AUC) Measure to Determine Acceptable Discrimination Between Veterans who Relapsed within 90 Days and Veterans who did not.

Accuracy	Specificity	Sensitivity	AUC
0.83	0.115	1	0.722

Note: The AUC data above is a measure of the accuracy of the quantitative diagnostic test. The AUC value is .72, which is in the acceptable discrimination range between Veterans who relapsed within 90 days and those who did not.

Table 11

Model Fit Indices

Model	Deviance	AIC	R^2
1	117	131	0.114

Table 12

Multicollinearity Statistics

Collinearity Statistics	VIF	Tolerance
VARatingNum	1.15	0.867
TreatLengthNum	1.14	0.879
StruggleNum	1.1	0.91
SUDTreatmentNum	1.3	0.768
MaritalNum	1.03	0.969

Treatment length was significantly associated with relapse rates. Veterans who had treatment longer than 12 months had 68% lower odds of relapse compared to those with less than 12 months of treatment (OR = 0.32, 95% CI [0.11-0.92]) .

Table 13

Model Coefficients

						95% Confidence Interval	
Predictor	**Estimate**	**SE**	**Z**	**p**	**Odds ratio**	**Lower**	**Upper**
Intercept	2.864	0.752	3.806	< .001	17.525	4.0111	76.565
VARatingNum:							

Neither Satisfied nor Dissatisfied – Dissatisfied	0.465	0.711	0.655	0.513	1.592	0.3955	6.412
Satisfied – Dissatisfied	-1.269	0.962	-1.319	0.187	0.281	0.0426	1.853
TreatLengthNum:							
Over 12 Months – Less Than 12 Months of Treatment	-1.128	0.534	-2.11	0.035	0.324	0.1136	0.923
StruggleNum:							
Over 12 Months – Less Than 12 Months	-0.551	0.589	-0.936	0.35	0.576	0.1818	1.828
SUDTreatRatingNum:							
Some Level of Effe – No Reported Effect	-1.378	0.722	-1.909	0.056	0.252	0.0612	1.038
MaritalNum:							
Presently Married – Not Married	0.596	0.5	1.192	0.233	1.815	0.6808	4.84

Note. Estimates represent the log odds of "LastRelapseNum = Used/Misused Substances in Past 90 Days" vs. "LastRelapseNum = Not Used/Misused Substances in Past 90 Days"

Summary

This project sought to answer two separate research questions. The first question was, "Are Veterans, who have been diagnosed with SUD, satisfied with current treatment methods provided by the US DVA healthcare system?" This question was selected to assess current attitudes, beliefs, and opinions on current treatment methods provided to Veterans. While reviewing the information provided by the Veterans in their surveys, it was determined that Veterans seem to be indifferent/neutral to their current treatments. The majority of their answers did not indicate their treatments were effective, and the majority of their answers also did not indicate overall feelings of dissatisfaction with treatment. Many Veterans indicated they had received 1 or less years of SUD treatment, which may or may not be connected to their

indifference to treatment. Further evaluation should be conducted with Veterans to determine this potential connection.

It is possible a correlation exists between Veterans who extensively struggle with SUD for several years prior to seeking treatment and a shorter period of treatment lasting less than 12 months. More research should be conducted to determine if there is a correlation between an extensive number of years of SUD and less than 12 months of reported treatment. Prior to seeking treatment, 36% of surveyed Veterans noted they struggled with SUD for 5+ years and 34% of Veterans noted they struggled with SUD for 1-4 years, revealing 70% of total surveyed Veterans struggled with SUD for 1-5+ years prior to seeking treatment. Therefore, further research should also be conducted to determine the reasons why some Veterans struggle with SUD for extended periods of time before seeking treatment.

The secondary research question for this project is, "Once Veterans receive information on MMT for SUD treatment in the civilian population, will a majority of surveyed Veterans demonstrate positive interest in this treatment program?" The overwhelming majority of surveyed Veterans indicated, after receiving information on MMT, a positive interest in trying it in their treatment programs. The majority of surveyed Veterans would like to participate in the full-spectrum 16-week MMT program as it was explained to them in the surveys.

While more research should be conducted to determine why Veterans seem to be neither satisfied nor dissatisfied with their SUD treatment at the DVA, it is suggested additional research be conducted with Veterans to determine additional interest levels in trying the MMT program for SUD. It is believed Veterans will benefit greatly from the MMT program, and they have confirmed an overwhelming majority interest level in trying this program.

Chapter 5

Summary, Review, and Conclusions

Introduction

The first goal of this study was to receive anonymous feedback from Veterans, who have been diagnosed with SUD, on current and related healthcare treatment options provided to them and determine their satisfaction levels. The second goal of this study was to share information with them on the Matrix Model of Treatment and determine interest levels among the Veterans in trying this method of SUD treatment. The primary research question from this project has been focused on the Veterans and their beliefs, thoughts, and opinions on current treatment methods offered by the Department of Veterans Affairs. The second research question from this project attempted to determine if Veterans would be interested in trying the MMT program, which has been proven effective in reducing SUD relapse rates in the civilian medical communities (Eghbali et al., 2013).

Project Origin and Problem Statement

This project was started due to the personal experiences and literature review conducted by the student researcher. After nearly 25 years of Army service, the project's student researcher has worked closely with many fellow Veterans and military families impacted by the consistent and overwhelming effects of strife, difficulties, and hardships created by substance use disorder. The sweeping problems stemming from substance use/misuse have impacted many innocent people throughout the US, in both civilian and military communities alike. The primary purpose of this research was to give Veterans an opportunity to anonymously report their feelings and opinions on current treatments provided to them for SUD. While they were generating and relaying their thoughts on current treatments, they were also provided with information on MMT,

which has been proven successful with many people suffering from SUD in the civilian communities across the world. This second purpose for the project was also intended to receive feedback from the Veterans on whether they would be interested in trying the MMT program in their SUD treatment settings. It is believed, based on the current literature explanations and personal observations, that Veterans may not be truly satisfied with treatment provided by DVA and newer models such as MMT may be of interest to them.

Summary of the Findings Discussion and Interpretation of Results

Results of the surveys were reviewed using statistical analysis, and the data generated was based on self-reported Veteran information. In terms of Veteran feedback on current SUD treatment methods, the responses seemed to favor the belief that Veterans are not satisfied overall with current treatment. Several statistical reviews yielded a significant relationship between the amount of time Veterans struggled with SUD prior to seeking treatment and the amount of time they conducted treatment (and their reported treatments may have stopped for reasons unknown). Other data reviews demonstrated a significant relationship between whether Veterans believe their concerns are properly listened to by their treatment providers and the gaps they indicated exist between the SUD treatment they receive versus the SUD treatment they prefer to receive. The second focus of this research project was to determine interest levels in the MMT program among participating Veterans.

Integration of the Findings with Previous Literature

Substance use disorder has generated a highly detrimental impact on Veterans as a community, and the consistently high rates of relapses among them (both during and after medical treatments) has been severe enough to merit national attention. Sprong, Hollender, Paul, Gilbert, Weber, Garakani, and Buono (2022) estimated and noted nearly 1.1 million Veterans

throughout the USA demonstrate the proper symptoms for diagnosis of an SUD, where 1 out of every 4 Veterans struggles from the use of illicit drugs, 4 out of every 5 struggle from alcohol use/misuse, and 1 in every 13 Veterans struggles from a combination of these two conditions. With increasingly high numbers of SUD symptoms among Veterans, those who seek help from healthcare providers often suffer from relapses both during and after their treatments. This study's records of relapse rates are in keeping with the Betancourt et al. (2021) study, where approximately 94% of Veterans indicated they relapsed back to substance use after their discharges from residential or outpatient SUD treatment centers. Additionally, a high relapse rate (76%) was recorded among Veterans after conducting SUD treatment in the Decker (2017) study. Pedersen et al. (2022) posited Veterans who experience a relapse during treatment may experience feelings of shame, which can cause them to feel alienated and disinterested in returning to the staff and facilities initially providing the needed support.

Many Veterans are not taking proper medication to help prevent relapses. Teeters et al. (2017) noted medications can assist with the reduction of withdrawal symptoms during treatment, where such withdrawal symptoms could serve as a trigger toward relapse if untreated. Other studies have advocated medications as a deterrent in decreasing substance cravings. One of the key foundations of MMT is proper and consistent use of proper medications designed to treat SUD. It was noted 40%, 95% CI [0.32-0.49] of the 135 surveyed Veterans surveyed for this study, indicated they were currently provided with prescription medications in their treatment for SUD. Binger, Ansara, Miles, and Schulte (2020) noted specific medications, such as treatments with buprenorphine/naloxone (BUP/NAL), can be effective in helping reduce relapses among Veterans suffering from opioid use disorder. Given the currently high relapse rates among

Veterans. It is believed medication management, as a key contributing platform for MMT, could be of great benefit to the Veterans who are suffering from SUD.

During review and analysis of Veteran responses to this study's surveys, a significant amount of interest was demonstrated for access to MMT as a treatment program. Additionally, the participants also showed affirmative beliefs other Veterans would benefit from trying MMT as a treatment option. The Veterans responded overwhelmingly in favor of trying MMT at 91%, 95% CI [85%-95.3%]. One of the noted problems, or gaps in scientific literature, pertains to the prediction and explanation of considerably high relapse rates among Veterans who have received SUD treatment from the DVA. The majority of participating Veterans (81%, 95%CI [73.1%-87%]) in this study indicated they relapsed to a substance use/misuse condition within the past 90 days. Other scientific studies have shown Veterans reported significant problems with relapse during and after SUD treatments. It is suggested this exploratory study be replicated with a larger sample population size to seek additional information on why relapse rates continue to be high among Veterans who have received or are receiving SUD treatment.

Additionally, 83%, 95%CI [75.5%-88.9%] of the Veterans surveyed indicated "Not Really" or "They Do Not Listen To Me" when asked if DVA representatives listened to their concerns. This high percentage from surveyed Veterans is in keeping with a statement from Congressman Mr. Michael A. Michaud, who indicated the DVA is "widely known to have a culture of denying problems and not listening to feedback, be it from Congress, Veterans, or its own employees" (Veterans Affairs Whistleblowers, 2014). True, Rigg, and Butler, (2015) similarly noted Veterans' negative healthcare encounters and interactions with staff contributed to a continuance of avoidance and ultimately an abandonment of treatment; several Veterans described such healthcare experiences as re-traumatizing for them. Harrigan (2018) also detailed

a primary concern of most Veterans as it pertains to healthcare providers' lack of education on Veterans' health, and she noted providers' failures to properly assess for behavioral health disorders.

Literature Review Comparison with Project Results

The answers to this project's surveys indicate several significant concerns among the surveyed Veterans. Particularly, they indicated they have experienced high relapse rates to substance use/misuse after receiving treatment, and they have also indicated "less-than-satisfied" responses for their current treatments. Guthrie-Gower and Wilson-Menzfeld (2022) indicated Veterans established and sustained close personal relationships while serving in the military, which helped reduce feelings of social isolation and loneliness during difficult times. However, developing a new sense of belonging and social connection in their civilian communities often proved difficult for many Veterans, as many of their existing relationships were severed upon separation from the military (Guthrie-Gower and Wilson-Menzfeld, 2022). This lack of social connection combined with feelings of loneliness and isolation have been connected to the development of depression and anxiety among many people.

Mushtaq, Shoib, Shah, and Mushtaq (2014) noted depression can often result from developmental loneliness, which often stems from several factors including significant separations, changing living arrangements, and physical/psychological disabilities. During their separations from the military and into civilian life, many Veterans may have felt the effects of developmental loneliness and depression. Fitzke et al. (2021) noted Veterans screened for depression prior to the COVID-19 pandemic demonstrated an increasingly high level of substance use/misuse after the pandemic began. Loneliness is believed to compound the effects of depression on increased rates of substance use/misuse, and social support was not as available

or protective against the impacts of depression on substance use and/or misuse (Fitzke et al., 2021). Increased rates of substance use/misuse were noted in other studies.

Kelly et al.(2022) noted a consistent pattern of increased cravings and inclinations among Veterans toward substance use/misuse as associated with increasingly high levels of loneliness. This unfortunate combination of personal feelings of loneliness, isolation, and depression proved extremely difficult for many veterans who are struggling with substance use/misuse. It is believed the COVID-19 pandemic worsened the situation for these Veterans, as their increased feelings of loneliness and depression may have led to increased inclinations toward substance use/misuse.

Implications

The implications for this exploratory study are varied. The responses from the Veterans demonstrated statistical significance across many key areas of concern, to include high relapse rates, "less than satisfied" assessments of current treatments, and their recorded concerns that DVA staff "do not listen to them." This study, while detailing results similar to published scientific studies, estimates high relapse among study participants. It is a concern which must be addressed, as it may be possible the current SUD treatment methods provided to Veterans may not be as effective as needed.

It is imperative that Veteran attitudes and opinions be considered, as their relapse rates remain increasingly high. Additionally, approximately 91% of the surveyed Veterans demonstrated a positive interest level in trying the 16-week MMT program during their SUD treatment. It is suggested that MMT be explored with Veterans, since it has been proven to be effective among civilians in their respective hospitals and clinics.

Implications for Education

The implications and information generated for this project certainly have benefits and application for education. This project should provide important information to those dedicated to providing healthcare services to US Veterans. It provides the Veterans' latest insights, beliefs, opinions, and attitudes toward current SUD treatment methods, and it also helps bring attention to their increasingly high relapse rates. The majority of those surveyed stated a basic attitude of indifference to current treatment methods, and this is important for healthcare providers to note.

This indifference may be correlated to why Veterans relapse to substances during and/or after SUD treatment is provided to them. The information provided from this project could also be useful for those who are about to enter the SUD treatment and counseling professions. It will give them early understandings of where Veterans are in terms of current treatment methods, and it will also help provide a synthesis of gained knowledge on Veteran interests in trying new methods not yet provided to them. This latest survey data is especially necessary to understanding their communicated interests in the integrated treatment models, such as MMT.

Additionally, the survey responses collected from Veterans have been recorded in the past year, thereby making them current for application to education on SUD treatment among Veterans. Also, this project has raised awareness of substance use/misuse among the Veteran population, and it has provided specific educational information to Veterans who have responded with positive interest in trying the MMT program during SUD treatment. Also, this study brings support and awareness to the high relapse rates among Veterans so additional educational resources and information can be provided to educators in the mental health field, as well as help train other behavioral health professionals regarding this growing and urgent matter among Veterans.

Implications for Practice

There are several implications for behavioral health practice in this study. When reviewing responses from the Veterans, it was noted there are high relapse rates, a less than satisfactory rating for current treatment methods, and also information pertaining to an increased interest in trying the MMT program. These points of data from the veterans are important for behavioral health practitioners, because they convey a message that their current treatment does not seem to be very effective with helping them avoid relapses. Also, behavioral health practitioners may find it interesting that the veterans want to try the MMT program, which has been shown to be successful with many non-Veteran civilian treatment centers and facilities.

Implications for Public Policy and Further Research

The DVA management and staff officials consistently strive to improve behavioral healthcare treatments for Veterans, as well as provide them with the best medical treatment resources possible. This study has important implications to the DVA, regarding their current treatments provided. This study also provides data demonstrating an increasingly high number of relapses among surveyed veterans. Finally, this study demonstrates a very strong interest in trying the imminent program, which is an extensive, 16-week SUD treatment program they seem to have a strong interest in trying. Perhaps VA may consider MMT for STD treatment among veterans and their hospitals and clinics, as well as provide access for family members who wish to support their family members seeking treatment at DVA facilities.

There are several implications from this project which are relevant to further research. The first implication is that this project should be considered an exploratory study, since the population size was rather small. It is suggested this study be replicated by other researchers to bring additional understanding to the increasingly high relapse rates among Veterans, possibly

determining the specific reasons why relapse rates are currently so high. It is also important to explore why veterans communicated they do not believe DVA healthcare representatives do not listen to them. Additionally, this study should be replicated so that additional insights can be made regarding high Veteran interest levels in trying the MMT program during their SUD treatments.

Limitations and Recommendations

Prior research studies indicating that Veterans are less likely to discuss their healthcare and medical needs and concerns were consistent with this study. While canvassing over 40 different organizations exclusive for Veteran use and providing 85+ days for their responses, this project only received 152 answered surveys. From the 152 Veteran responses, only 135 were deemed valid and qualified for proper application and analysis to the study. Therefore, it may be appropriate to classify this project as an exploratory study into the assessment of SUD treatment as reported anonymously by Veterans.

A considerable limitation associated with the use of anonymous surveys was the dependence solely upon the participants' self-reported data. The project's primary consideration is that all SUD diagnoses were collected from the project participants' self-reporting, where no medical records analysis or diagnostic evaluations were conducted to confirm and validate the official medical and psychiatric diagnoses of the anonymous Veterans. While a five-question, clinical-approved assessment/screening instrument "CAGE-AID" could be integrated into future surveys for the assessment of participants' harmful alcohol and drug use/misuse (Basu et. al, 2016), a more precise review/evaluation of substance use diagnostic criteria could have helped further substantiate this research. As a second consideration, Veterans experienced changes in their self-reported interests and responses to suggestions (such as the 12-Steps Program) after

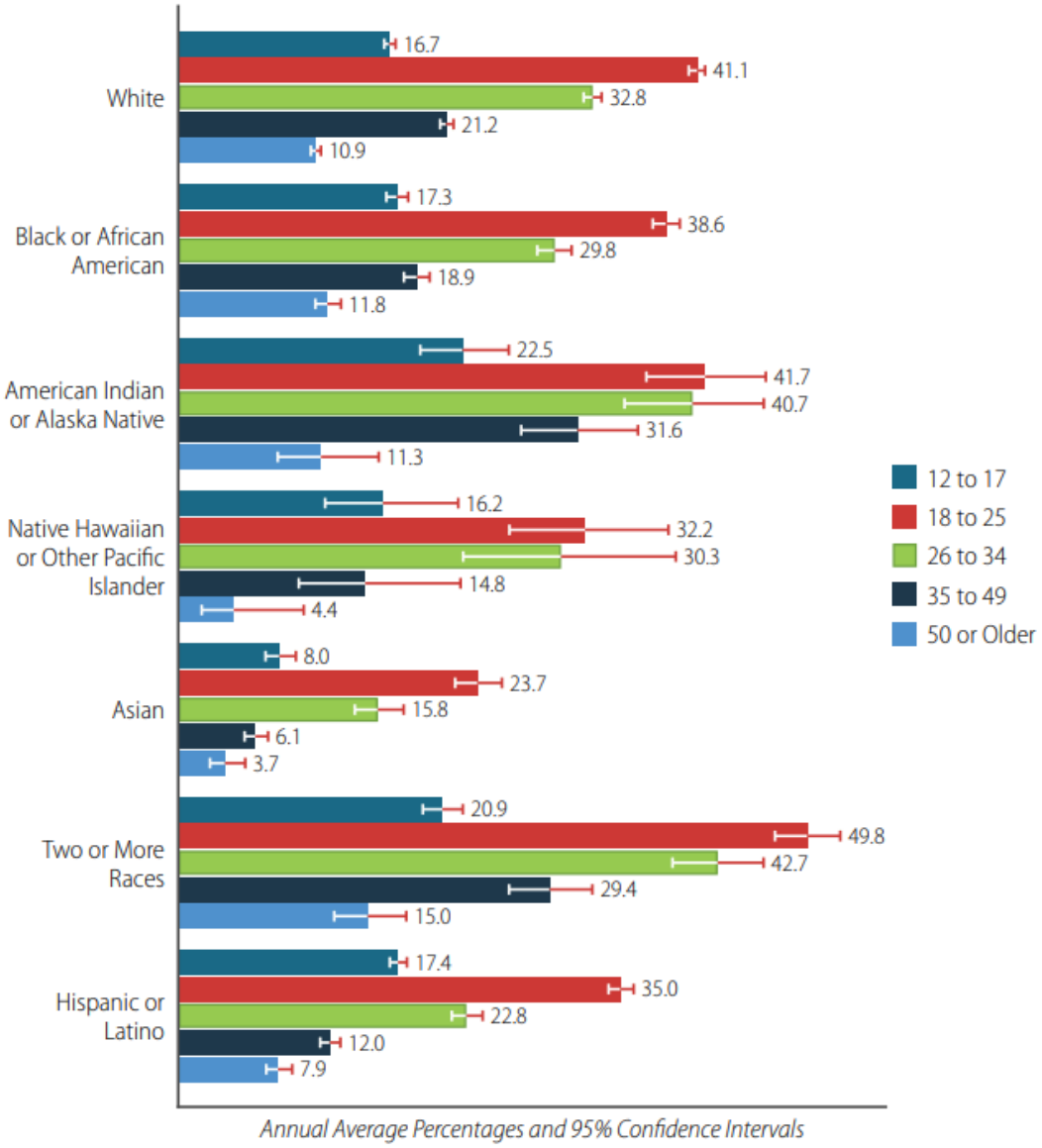
reading more information about the Matrix Model of Treatment (MMT) after Question 18, Veteran responses might be subject to social desirability biases, as well as response and recall biases.

However, many previous and similar surveys were hindered by recall limitations and provided the anonymous and online factors of this project's surveys, biases in social desirability and participant response are probably low. The lower-than-expected recruitment from the current study may be due to factors specific to the Veteran population. Previous studies have demonstrated a reluctance among Veterans to pursue SUD treatment even when an SUD diagnosis has been provided. Boden and Hoggatt (2018) noted Veterans were less likely than non-veterans to seek treatment and discuss their concerns with others. In a more recent study conducted by Kline et. al (2022), Veterans have consistently demonstrated a decreased interest in seeking behavioral health treatment. Kline et. al (2022) found that less than 33% of Veterans with a potential mental health disorder or SUD reported consistent and regular engagements with mental health professionals. To help ensure access to the surveys was exclusive to Veterans, the Veteran organizations contacted for support with disseminating the surveys to Veterans in an anonymous format included the American Legion, Veterans of Foreign Wars, and several other organizations which were accessed exclusively by Veterans. For the safety and privacy of their members, these organizations informed the researcher they do not allow non-Veterans regular access to their inner facilities and gathering areas

Additionally, generalizability of this project's current sample of Veterans could be faulty/limited due to a sample which represents different ratios in terms of racial/ethnic characteristics than the overall United States Veteran sample data (for example, the project sample information provided was from 59% Caucasian/White participants, whereas

Caucasian/White Veterans compose 80% of the total U.S. Veteran population). Perhaps the generation of a Veteran organizational-recruit initiative with internet-based survey development and methodologies could have been susceptible to biased/ inaccurate responses from participants. Figure 9 demonstrates illicit drug use by race/ethnicity and age group across the United States' entire population from 2015-2019 (Center for Behavioral Health Statistics and Quality, 2021).

Figure 9: Illicit Drug Use in the Past Year by Race/Ethnicity and Age Group: 2015–2019



Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2015–2019.

The project's researcher integrated Qualtrics' quality control tools for review, consulted organizations which were exclusive to Veterans only for participant verification, and data inclusion analysis procedures to reduce these concerns; this included a review for "click-through" responses by evaluating time consumed on each survey (Teichter et. al, 2015), and data-scrubbing analysis for internet-based Veteran-organization quality, thereby generating results with a higher confidence pertaining to the surveys' response qualities. Finally, another critical limitation to this project was its cross-sectional nature to measure current beliefs, attitudes, and thoughts from Veterans.

Therefore, it is difficult to fully assess the Veterans' directional path or causality, connections, and correlations of the relationships between two or more variables. This can limit research abilities to properly predict updates, changes, and adjustments in substance use/misuse behaviors among the sampled Veterans or the functions outside of their self-reporting of this potential adjustment/change. Survey distribution and data collection were conducted over a period of 85 days to compensate for the high "grit" levels of hesitation many Veterans acknowledge as a significant disinclination factor to their participation in behavioral health programs and studies (Kline et. al, 2022). Despite this scientifically acknowledged amount of Veteran disinterest in responding, 135 valid and qualified responses were collected for statistical analysis. Regarding the logistic regression model, there was some indication of non-preciseness due to the small population size. Even with significant variables, this study will still have a lack of precision within the confidence interval. This study cannot provide sort predictions or solid conclusions based on this model alone because of the small sample size, and the low prediction value. While logistic regression analysis was used to investigate Veterans' relapse rates in current treatment methods, most participants indicated interest in the MMT program. The assessment of

other newer treatment methods, not yet fully implemented by the DVA, are beyond the scope of the current project and should be reviewed for consideration in future research. Replication of this project with a larger number of participants should provide additional clarity.

Recommendations

Based on the Veteran responses provided to this study, it is recommended to replicate this project for additional research. Due to the small population size of 135 qualified responses, this project should be classified as an exploratory model to research and determine thoughts, feelings, and beliefs from veterans on their SUD treatment settings, conditions, and environments. Further, more questions should be asked on what particularly is causing veterans to relapse at such high rates back to substance use/misuse.

Additionally, it is recommended a pilot study of the comprehensive 16-week MMT program be completed with Veterans diagnosed with SUD. High levels of interest in trying this program were reported by Veterans. In combination with this interest, the high relapse rates reported by Veterans in their current treatment settings demonstrates a possible need for change in treatment. A pilot study with MMT could potentially provide significant impact on reducing the Veterans relapse rates, just as MMT has helped reduce relapse rates among non-Veteran civilians.

The replications of this study should consist of gaining additional and more extensive support from organizations which are exclusively maintained and frequented by Veterans. It is also suggested that more Veteran organizations be contacted, and at least 6 to 12 months be provided for Veteran responses. Such measures should be taken in order to increase the contributing Veteran population to the surveys. It is suggested that Veterans be allowed to

continue maintaining a status of anonymity while filling out these surveys so they may feel more inclined to participate.

Summary and Conclusion

In summary, this project was initiated due to personal and professional interests in helping fellow Veterans avoid substance use/misuse and subsequent relapses both during and after behavioral health treatment. It was discovered during the analysis of Veteran responses that relapse rates are increasingly high, Veterans do not seem to be satisfied with their current treatments, improvements may be necessary to their current treatment environments, and veterans seem to be overwhelmingly interested in trying the MMT program. The research, findings, and summary of the literature review and Veteran survey responses demonstrate two critical points.

First, Veterans communicated they are neither satisfied nor dissatisfied with their current SUD treatments provided by the DVA and their SUD relapse rates are increasingly high. Second, surveyed Veterans overwhelmingly demonstrated positive interest in trying the MMT program as part of their current treatment settings. Key elements and the promising results of MMT within the non-veteran and civilian medical facilities demonstrate a very distinguished opportunity to help Veterans with integrated treatments. Veterans have communicated an interest in trying the integrated psychosocial components of MMT, and they also noted there are significant gaps in the treatment provided to them by the DVA vs. the treatments they would like to try. Additional research is needed which continues to examine the interests and beliefs Veterans have about SUD treatments.

A pilot study is recommended for Veterans where they fully participate and engage in the comprehensive, 16-week MMT program. More comprehensive and consistent data are needed

to better examine the delivery of MMT methods to the Veterans across the full range of treatment opportunities for them. A systematic approach to evaluating MMT's psychosocial interventions may be beneficial in determining the efficacy of this program for Veterans seeking SUD treatment.

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Appendices

Appendix A: Veteran Survey Template……..…106
Appendix B: Informed Consent Form……..……..112

Appendix A
Survey Questions / Template
Created for Participation among US Veterans diagnosed with Substance Use Disorder and currently receiving treatment
Christopher R. Strunk

1.) **Age:** What is your age?
A.) 18-39
B.) 40-64
C.) 65+

2.) **What is your Gender?**
A.) Male
B.) Female
C.) Other

3.) **What is your Primary Racial Identity?**.
A.) American Indian or Alaska Native
B.) Asian American
C.) Black or African American
D.) Hispanic or Latino or Spanish Origin
E.) Native Hawaiian or Other Pacific Islander
F.) White or Caucasian American
G.) Multiple Races
H.) Other

4.) What is your marital status?
A.) I am Single (Never Married)
B.) I am Presently Married or in a Domestic Partnership
C.) I am Separated
D.) I am Divorced
E.) I am Widowed

5.) **What is your Education Status?**
A.) High School Diploma and/or GED Certificate
B.) Some College, Trade, or University Courses Completed, but No Degree Yet
C.) College, Trade, or University Degree
D.) Graduate or Advanced Degree

6.) What is Your Current Employment Status?
A.) I am Currently Employed
B.) I am Currently Unemployed, but Looking for Work
C.) I am Currently Unemployed, and Not Looking for Work
D.) I am Currently Disabled and Not Able to Work
E.) I am Retired

F.) I am Currently a Student and Employed
G.) I am Currently a Student and Not Employed

7.) To Help Clarify Eligibility for this Survey, Have You Ever Received Medical Treatment for Substance Use Disorder?
A.) Yes
B.) No
C.) I am Not Sure

8.) How Long Did You Struggle with Using/Abusing Substances **Before** Seeking Professional Treatment and Help?
A.) Less than 12 Months
B.) 1-4 Years
C.) 5+ Years

9.) How Long Have You Been Receiving or Have Received Professional Treatment for Substance Use/Misuse?
A.) Less Than 12 Months of Treatment
B.) 1-4 Years of Treatment
C.) 5+ Years of Treatment

10.) How Would You Rate your Overall Healthcare Treatment for Substance Use Disorder with the Department of Veterans Affairs?
A.) Satisfied
B.) Neither Satisfied nor Dissatisfied
C.) Dissatisfied

11.) How Would You Rate the Treatment of Substance Use/Misuse Provided to You?
A.) Very Effective
B.) Somewhat Effective
C.) Not Effective

12.) Do You or Were You Satisfied with Individual Therapy Sessions as Part of Your Treatment?
A.) Satisfied
B.) Neither Satisfied nor Dissatisfied
C.) Dissatisfied

13.) As Part of Your Therapy, Which of These Options were Provided to You?
A.) Individual Therapy Sessions
B.) Hospital / Clinic Group Therapy
C.) The 12-Step Group Therapy Program
D.) Prescription Medication
E.) Invited Family Involvement During Therapy with Your Request and Approval

14.) Are Family Members and/or Spouse Actively and **Positively Involved** in Your Treatment?
A.) Yes
B.) No
C.) Not Presently, but Would Like To

15.) Were You Ever Given the Opportunity to Invite Family Members to Join You During Treatment?
A.) Yes, and they joined me
B.) Yes, but they / I declined to join
C.) No

16.) Are Friends / Other People Presently, Actively, and Positively Involved in Your Treatment?
A.) Yes
B.) No
C.) Not Presently, but Would Like To

17.) I Believe My Concerns are Listened To and Properly Acknowledged by My Treatment Provider.
A.) Agree
B.) Neither Agree nor Disagree
C.) Disagree

18.) How Long Has it Been Since You Had a Relapse or Return to Use/Misuse Substances?
A.) I Have Used/Misused Substances within the Past 90 Days
B.) I Have NOT Used/Misused any Substances for at least 3-12 Months
C.) I Have NOT Used/Misused any Substances for at least 12+ Months

**********INFORMATION ON MATRIX MODEL**********

The **Matrix Model of Treatment** (MMT) is a specific Health Treatment Approach administered over the course of a structured, 16-week period. For many years now, MMT has been successful with civilians around the world who are trying to avoid alcohol and drugs, reconnect with family members, and live more successful lives. However, this program has not yet been fully implemented by the Department of Veterans Affairs into its healthcare system for Veterans.

The MMT program is highly organized and is largely made up of group therapy sessions. Participants learn about the addiction and recovery processes, how to avoid a relapse, and how to socialize in a drug-free environment.

As part of the Matrix approach, interested and helpful family members are also encouraged to actively and positively participate and become involved in the recovery of their loved one.

MMT can help treat any type of substance use disorder and has even been adapted for residential inpatient settings. In most MMT programs, participants come to the rehab center for treatment and return home each day.

The 6 Main Components of MMT are:

Individual Therapy Sessions: These meetings focus on treatment planning and checking in to determine the person's progress in the program. They may also involve family members or significant others.

Early Recovery Groups: Users who are in the first months of Sobriety meet to learn tools for dealing with cravings and managing their time and schedules. They create a daily schedule and monitor their progress with support from other group members and counselors dedicated to helping them.

Relapse Prevention Groups: Users learn and share strategies for staying sober. These groups are very organized and include 32 different topics on preventing relapse, such as changing behaviors, altering patterns of thinking, and getting involved in 12-Step Support Groups.

Family Education Groups: These groups take place over the course of 12 weeks and teach Family Members about the biology and science of addiction, the health effects of drugs, the conditioning of addiction, and effects of addiction on the Spouse, Family, Friends, and other important people.

Social Support Groups: These groups occur in the last month of treatment. Users focus on finding drug-free activities and friends that do not use substances.

Twelve-Step Meetings: Part of the Matrix Model approach is introducing participants to the 12 Steps and encouraging them to attend meetings together. Some programs have onsite meetings for those who want to join.

Additionally, the model incorporates several therapies, such as:

Cognitive Behavioral Therapy: Also known as CBT, this therapy helps users understand how their thoughts influence their behaviors. They learn how to replace negative thoughts that can lead to self-destructive behaviors with positive ones that promote healthier behaviors.

Motivational Interviewing: This counseling method is used to help people with substance use problems overcome their resistance to quitting drugs and engaging in treatment. The therapist and client relationship is a partnership, wherein the therapist works with the recovering person to identify their motivations to get clean and make positive changes in their life.

Contingency Management: This treatment strategy rewards drug-free behaviors, such as attending treatment sessions, and withholds rewards for substance-using behaviors (e.g., failing a urine test or not taking prescribed medications).

19.) Would You Like to Have Access to The Matrix Model as a Treatment Option?
A.) Yes
B.) Maybe
C.) No

20.) Do you Believe Other Veterans Would Benefit from Trying the Matrix Model of Treatment?
A.) Yes
B.) Maybe
C.) No

21.) Do You Believe Each of the Treatments included in the Matrix Model referenced below could be more effective in helping a person stay away from using / misusing substances?
A.) Individual Therapy Sessions
B.) Early Recovery Group Therapy
C.) Relapse Prevention Group Sessions
D.) Family Education Groups
E.) Social Support Groups
F.) Twelve-Step Meetings

22.) If Offered to You, Do You Believe the Involvement of Family and Friends Will Help You Avoid Relapse?
A.) Yes
B.) Maybe
C.) No

23.) Would You Like to Share Any Feedback on Treatments for Substance Use Disorder or the Matrix Model of Treatment?

**********THIS IS AN OPEN SPACE FOR DIRECT WRITTEN FEEDBACK**********

24.) As a Veteran, have any of your Department of Veterans' Affairs Treatment Providers ever discussed the 16-week Matrix Model of Treatment and Combined Support as an option to help you?
A.) Yes, but I Did Not Pursue This Treatment Program
B.) Yes, I Pursued this 16-week Program and Found it Helpful
C.) No, I was Never Offered to try this Program and Wish it was Offered to me
D.) No, and I would not like to try it

25.) Do You Believe there is a Gap in the Treatment You Currently Receive from the Department of Veterans Affairs and the Treatment You Would Like to Receive?
A.) Yes
B.) Sometimes
C.) No

26.) Overall, How Would You Rate Substance Use Disorder Treatment Provided by the Department of Veterans Affairs is:
A.) Good
B.) Average
C.) Poor
D.) Terrible

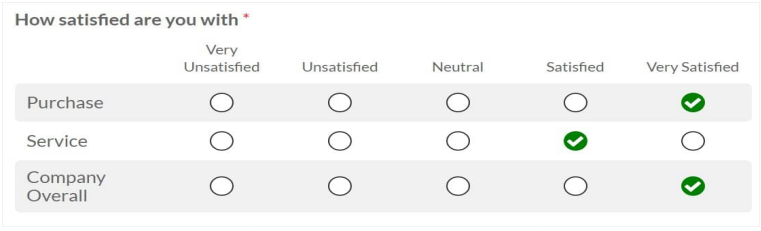
27.) Overall, I believe the Department of Veterans Affairs Listens to my Concerns.
A.) Definitely
B.) Not Really
C.) They Do Not Listen to Me

Thank you for submitting your information to this important survey.

As a Veteran, your contributions and answers are critical to improving treatment programs for Substance Use Disorder.

For More Information on the Matrix Model of Treatment, please review this website:

https://www.drugabuse.gov/publications/principles-drug-addiction-treatment-research-based-guide-third-edition/evidence-based-approaches-to-drug-addiction-treatment/behavioral-therapies/matrix



The survey's design model, featuring the Likert Scale, will be used to create the survey's questions similar to the ones depicted above.

Appendix B:

Informed Consent Form

The Department of Health Sciences at The University of South Dakota supports the practice of protection of human participants in research. The following will provide you with information about the research study which will help you in deciding whether or not you wish to participate. If you agree to participate, please be aware that you are free to withdraw at any point throughout the duration of the study without any penalty.

In this study, we will ask you to fill out a survey based on your thoughts and beliefs on current/past treatment methods available to United States Military Veterans who are/were experiencing Substance Use Disorder. The study also seeks to clarify if you are interested in seeking treatment support through the Matrix Model of Treatment. This Model provides the individual with an extensive 16-week treatment setting which encompasses multiple layers of support and response to anyone interested in participating.

If you have any objections to participating in the survey, please inform Mr. Strunk and the survey will end immediately. All information you provide will remain confidential and will not be associated with your name.

If for any reason during this study you do not feel comfortable, you may leave the survey and receive credit for the time you participated, and your information will be immediately discarded. Your participation in this study will require approximately 15 minutes. When this study is

complete, you will be provided with the results of the research if you request them, and you will be free to ask any questions.

If you have any further questions concerning this study, please feel free to contact us through phone or email: Mr. Christopher R. Strunk at Christopher.strunk@coyotes.usd.edu (803-553-0259) or Dr. Susan Puumala, the Research Program's Supervisor, at Susan.Puumala@usd.edu (605-658-5946). Please indicate with your signature on the space below that you understand your rights and agree to participate in the research study.

Your participation is solicited, yet strictly voluntary. All information will be kept confidential and your name will not be associated with any research findings.

_____ _____

Signature of Participant Christopher R. Strunk, Researcher

_____

Print Name