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# Utilization of an Opioid Antagonist and Comprehensive Medication-Assisted Treatment in Correctional Settings

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This is to certify that the doctoral dissertation by

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Abstract

Many people brought into the U.S. criminal justice system have substance abuse problems that served as the primary or secondary catalyst for offending. To treat substance use disorder in these individuals, medication-assisted treatment (MAT) is being evaluated as a viable option in the criminal justice system. The purpose of this quantitative study was to evaluate the effectiveness of a MAT treatment program by reviewing existing data regarding offenders who were receiving the opioid antagonist naltrexone, other supplemental medications, and cognitive behavior therapy in a therapeutic community inside a correctional setting. Biological and social learning theoretical frameworks guided the study. Secondary data were collected from quarterly reports submitted to the Virginia Department of Criminal Justice Services. Findings of *t*-test analyses indicated that participants had increases in overall brain health and decreases in symptoms of anxiety and depression after successful completion of the program. Findings may create positive social change by informing evidence-based practices and programs that seek to resolve addiction issues and support resiliency for individuals released from the criminal justice system and allow jail administrators a means of providing services that will not jeopardize institutional security.

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# Dedication

To women of all ages, remember to be an Esther! Be strong and courageous enough to stand for the truth, to voice your opinion, and to fight for the good of others, even when it means to sacrifice yourself. If God has put you in a position to make a difference, it is for a purpose. Thanks Annie!!

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There really are no words to express my gratitude to my husband, Tim, and daughters, Maddy and Sydney, for their unconditional, consistent love and support. There is absolutely nothing that means more to me than being worthy of that. You are the three people I want to make most proud. Love you more!

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# Chapter 1: Introduction to the Study

This study was created in an effort to identify an effective medication-assisted treatment (MAT) program in a correctional setting that did not add to the challenges already faced by correctional administrators. The MAT program to be evaluated exists through grant funding from the Virginia Department of Criminal Justice Services (VDCJS). The program provides patients in a correctional facility with an opioid antagonist, other supplemental medications, and cognitive behavior therapy, all while they are participating in a therapeutic community. The facility that houses the MAT program that was the focus of this study is a regional jail operating in Virginia, Western Virginia Regional Jail (WVRJ) with a rated capacity of 900 beds. The facility was selected for its consistent success with innovative programming. VDCJS provided funds for the Prisoner Grant Program that was then used for the implementation of evidence-based residential MAT services. MAT is used to treat addiction to opioids such as heroin and prescription pain relievers that contain opiates (Ersche et al., 2020).

The current study was based on secondary review of data available from VDCJS. There was no personal identifying information (PII) and no personal health information contained in the reports. These reports are available publicly and, if necessary, can be obtained through the Freedom of Information Act requests. Information pertaining to the grant request for proposal and other information available to the grant applicants was obtained. Permission from the grantor organization was requested and approved, and a letter of permission, support, and agreement was obtained before the data were collected and analyzed.

While these participants were all housed in the same correctional facility, the manner in which the data was collected was completely void of any PII. Prior to the administration of the testing instrument the first time, a number was generated for the participant which was duplicated one additional time for the posttest. Further, the participants were assigned different numbers when administered a separate testing instrument. Upon receipt of the data submitted to VDCJS, I would clean and modify the format to enter the scores into a spreadsheet created solely for the statistical analysis planned for chapter 4 results. While this data was available for public view, I utilized the same manner of data collection throughout the study to ensure consistency of secondary analysis.

As a requirement of the grant, data related to performance measures are collected four times per year to report activity during the prior 3-month reporting period. As part of the requirement for continued funding and to inform future policy decision making, these performance or outcome measures are being collected routinely at the regional jail and submitted to VDCJS. I conducted a secondary analysis of that data. Findings from analysis of these data may be used to inform correctional administrators in their spending for substance abuse treatment and overall, reentry programming. Although there was valuable data submitted to inform policy and evaluate the program effectiveness, there was no PII and no availability sharing of any protected health information.

## Background

Citizen opinions have varied over time regarding the most appropriate forms of punishment throughout the criminal justice system. Despite the ebb and flow of public

sentiment regarding crime and punishment, the goals of punishment remain unchanged: retribution, deterrence, incapacitation, and rehabilitation (Wilson & Petersilia, 2011). Although incarceration is a widely used sanction, it does not serve as a deterrent and it is expensive (Schmalleger, 2020). Rehabilitation remains a priority for many correctional professionals with the focus on treating and healing criminal offenders (Schmalleger, 2020). Rehabilitation is intended to help identify and resolve the causes of the offender's behavior.

Physicians and prevention advocates have warned for years that OxyContin and other opioids wreak havoc on the lives of those who use them. President Trump's administration declared the opioid epidemic a public health emergency with the Food and Drug Administration (FDA) focusing its efforts to aggressively deal with abuse and overdose (Califf et al., 2016). In 2014, there were more deaths attributed to opioid overdose than fatal car accidents for the first time (Moore et al., 2020). Emergency room visits for overdose increased at a rate of 89% between 2015 and 2016 in Virginia leading to a public health emergency being declared that same year (Moore et al., 2020). In 2019, nearly 50,000 people in the United States died from opioid-involved overdoses (National Institute on Drug Abuse [NIDA], 2021). The misuse of and addiction to opioids, including prescription pain relievers, heroin, and synthetic opioids such as fentanyl, is a national crisis that affects public health as well as social and economic welfare (NIDA, 2021). MAT is a valuable treatment modality, and research must be expanded to evaluate the use of naltrexone in a correctional setting.

I sought guidance from several medical providers who are currently administering MAT in correctional settings, and I reviewed the literature from medical periodicals they recommended (see U.S. Department of Health and Human Services, 2021). The Walden Library databases were used to identify scholarly, peer-reviewed articles when searching keywords such as *opioid epidemic*, *public health*, *addiction treatment*, *opioid antagonist*, *Methadone*, *Suboxone*, *Naltrexone*, *cognitive behavioral therapy*, *supplemental medications*, and *treatment in correctional setting*. These searches rendered a significant number of sources that provided a foundation that provided academic and intellectual guidance throughout the current study. In addition to naltrexone, there are supplemental medications that support regulation of dopamine levels in the brain and cravings and improve overall physical and psychological health, which could contribute positively to a program (Wise & Robble, 2020).

MAT, specifically the use of naltrexone combined with supplemental instruction on the holistic approach and treating an offender from the disease model perspective, may be a valuable tool to promote sustainable addiction recovery. Naltrexone is a full opioid antagonist, which means it prevents an opioid from reaching dopamine receptors in the brain (Lee et al., 2016). The benefit of oral naltrexone or its long-acting injectable form, Vivitrol, is that it has no diversion or abuse potential, making it ideal for a correctional setting.

There is a significant overlap of substance use disorder and mental illnesses co-occurring in individuals who are criminal justice involved. Comprehensive cognitive behavior therapy coupled with supplemental medical and psychiatric treatment with

pharmacological interventions would benefit this population but is currently not provided in the state of Virginia (Vanderplasschen, 2013). There is ample evidence of MAT's effectiveness in preventing relapse, but most of the literature examined the use of methadone and Suboxone (Saxon et al., 2013). These medication therapies are not widely endorsed by advocates, recovering addicts, or criminal justice practitioners because of the potential for diversion and abuse (Foster, 2018). Naltrexone is associated with lower rates of opioid relapse than non-MAT therapies. Despite evidence to support the effectiveness of MAT, it is rarely used in correctional settings for inmates with opioid use disorder or those receiving treatment in the community prior to incarceration (Nunn et al., 2009). A report published by the Virginia Department of Behavioral Health and Developmental Services indicated that although there are numerous individuals being provided MAT services following incarceration, there are barriers to treating patients in correctional settings (Wessells, 2021).

There is a significant stigma associated with treating those with substance use disorder because it is not yet seen as a genuine medical condition such as hypertension or diabetes. Further, clinicians and medical staff in a correctional setting are reluctant to provide the necessary services because they lack education and experience with treating addiction beyond the initial acute needs of withdrawal (Wessells, 2021). In addition to the stigma and lack of education, there is a concern regarding diversion potential of methadone and Suboxone; although there are safeguards that can be implemented to reduce the risk, most agencies remain reluctant (Wessells, 2021). Treatment providers and advocates agree that there needs to be more evaluation of this pharmacological

intervention especially when coupled with a holistic approach to addiction therapy (Nunn et al., 2009).

Addressing addiction from a criminal justice perspective that focuses on incarceration with no regard for a treatment component is not effective in reducing recidivism (Rosenblum, 2002). Further, this method leads to a disruption of family and other support systems, could serve to further criminal thinking and behavior, and does nothing to break the addiction cycle (Rosenblum, 2002). In addition, these offenders are exposed to periods of abstinence and better health care, their tolerance to a given substance decreases, and the risk of overdose after release is significant (Brinkley-Rubinstein et al., 2017). A better way to address addiction is from a disease model in which treatment is included and harm-reduction strategies are provided during incarceration. Provisions for continued care and postrelease services can be implemented while individuals are serving their criminal sentence.

According to Substance Abuse and Mental Health Services Administration (SAMSHA), as cited in Evidence-Based Resource Guide Series Overview, 2016), the incidence of "opioid abuse impacts an estimated 32 million people worldwide" (p. 1232). The epidemic of opioid addiction is pushing changes in criminal justice attitudes and policies at local, regional, and federal levels (Kinlock & Schwartz, 2009). Studies have shown that MAT programs are effective tools for treating individuals with an opioid addiction because they provide one of three medications coupled with counseling for substance use disorders to aid in abstinence and recovery and prevent overdose by death in relapse (Wessells, 2021). Participants must have a diagnosis that meets the Diagnostic

Statistical Manual criteria for an Axis I substance use disorder to be eligible and confirmed opioid addiction as confirmed by self-disclosure and laboratory testing.

MAT during incarceration has been used to some degree but not from a holistic perspective as in the program that served as the focus of the current study (see Wakeman & Rich, 2015). The MAT program studied provides the opioid antagonist naltrexone combined with two additional supplements that increase dopamine and reduce cravings, as well as cognitive behavioral therapy and participation in a therapeutic community while incarcerated (Russell, 2020). Treatment programs such as this are helpful in that they address substance abuse but also behavior modification and accountability, which play a significant role in recovery (Lee et al., 2016). This type of treatment modality allows the criminal justice system practitioners to exercise as a point of contact to connect individuals with community-based resources following incarceration (Fahmy & Mitchell, 2022). Patients can receive treatment and can also be linked to intensive case management programs in which individuals receive a wide range of resources to address transitional and/or permanent housing, substance use treatment and recovery programs, and legal obligations (Fahmy & Mitchell, 2022).

Patients participating in the residential substance abuse treatment (RSAT)MAT program are screened for medical stability prior to entering the MAT component of the therapeutic community (Russell, 2020). Once the patient is medically screened, their prior substance abuse history is evaluated to determine their appropriateness for MAT and to ensure those approved have a use history of primarily opiates and alcohol (Russell, 2020). Once admitted into the program, the patient is started on oral naltrexone, a

supplement that increases dopamine, and a liquid multivitamin (Russell, 2020). These combined medications treat the patient as a whole person. Naltrexone addresses their substance cravings, the supplement improves mood and reduces cravings, and the multivitamin ensures that the brain and body have the nutritional elements needed for healing. Those participating in the MAT program are also provided with weekly and biweekly cognitive therapy with a board-certified psychiatrist (Russell, 2020).

## Problem Statement

Opioid addiction and overdoses have reached an alarming level impacting many countries in the world (McElrath & Joseph, 2018). This public health crisis is impacting Canada, Australia, Europe, and Asia regardless of the type of public health care employed or the criminal justice policies (Global Commission on Drug Policy, 2017). Further, the addiction to prescription opioids has been characterized as a precursor to injectable drug use, primarily heroin, because it is more readily available, not controlled, and cheaper when the legal prescription is no longer valid (McElrath & Joseph, 2018). The intravenous use of drugs is causing a similar increase in hepatitis C, HIV, and other communicable diseases with long-term health concerns (McElrath & Joseph, 2018).

Beginning in the late 1990s, the use of opioids in the United States expanded on an unprecedented scale. During this period, opioid-related overdose deaths nearly quadrupled (Vadivelu et al., 2018). In the early part of the 2000s, the number of people abusing and misusing opioid pain relievers doubled and has consistently increased over time (Vadivelu et al., 2018). By 2014, there were over 47,000 drug overdose deaths, surpassing deaths due to motor vehicle crashes and firearms (Centers for Disease Control

and Prevention [CDC], 2013). That year, the CDC (2013) added opioid overdose prevention to its list of top five public health challenges and declared the worst drug overdose epidemic in U.S. history. By 2019, over 70% of the deaths that occurred in the United States were the result of an opioid overdose (CDC, 2020).

Former President of the United States Donald Trump recognized as did the President before him, that the opioid epidemic and the rate of drug-related deaths had reached a level that constituted a public health emergency (Califf et al., 2016). Trump highlighted the necessary efforts that must continue to battle the opioid crisis supporting and signing legislation such as the SUPPORT Act, which requires Medicaid and Medicare to cover the costs of medications used in the treatment of substance use disorder (Collette et al., 2020). The National Institutes of Health (NIH) also funded $945 million for treatment research, and states saw a significant increase in federal dollars dedicated to addressing opioid addiction treatment (Collette et al., 2020).

The state of Virginia has experienced an increase in overdose deaths as well, as determined by the Office of the Chief Medical Examiner. Pursuant to §32.1-283 of the Code of Virginia, any death from trauma, injury, or poisoning attributable to accident, suicide, or homicide as well as any other suspicious, unusual, or unnatural death must be investigated further by the medical examiner (Hobron, 2021). The Virginia Office of the Chief Medical Examiner codes each unnatural death for each individual drug using toxicology reports and cause of death statement and submits quarterly reports to the Virginia Department of Health (VDH; Hobron, 2021). The main purpose for toxicology is to confirm or eliminate the unnatural death as an overdose, determine whether

overdose was a contributing factor in another cause of death (e.g., motor vehicle crash), and determine the necessity of further legal action.

Reporting on the top three causes of unnatural deaths in the state of Virginia, the VDH listed motor vehicle accidents, gun-related deaths, and fatal drug overdoses for the period 2007–2020 (VDH, 2021). The same report indicated that since 2013, fatal drug overdoses had been the leading cause of unnatural deaths with 1,626 overdoses in 2019. Perhaps more alarming is that the following year, 2020, the total number jumped to 2,242 overdoses (VDH, 2021). The COVID-19 pandemic has also contributed negatively to the overdose rate, with Virginia seeing a 62% increase in the months following March 2020 when the order was given to lockdown (VDH, 2021). Although these statistics are discouraging, fatality is a small portion of the consequences of drug overdose. Other consequences include poor health outcomes such as acute infections, long-term health complications, and legal issues such as incarceration, crime, and loss of child custody (Vadivelu et al., 2018).

Contributing to the overdose statistics at a markedly high rate are those who are criminal justice involved (Brinkley-Rubinstein et al., 2017). Correctional facilities are well positioned to improve access to substance abuse treatment and recovery services and to promote the use of MAT. There is debate regarding the use of methadone and Suboxone in drug treatment because both have addictive properties and diversion potential in a jail setting (C. Jones et al., 2015). Agonists or partial agonists are considered controlled substances that can be abused in a manner like other opioids. Addicts will seek these medications to avoid withdrawal during incarceration as well as

criminal diversion. Clinically, opioid agonists and partial agonists have been associated with respiratory depression, overdose, and death, and offenders need considerable monitoring. Conversely, the use of MAT with the opioid antagonist naltrexone has not been highlighted in the literature and is not being promoted as a viable option in correctional medicine and substance abuse treatment. The treatment of opioid-addicted individuals who are criminal justice involved with MAT, specifically the use of opioid antagonist naltrexone, supplemental medications, and cognitive behavior therapy, was the problem the current study addressed. The data that are being collected by the institution and submitted quarterly to VDCJS were the subject of the secondary analysis.

## Purpose of the Study

The purpose of this quantitative study was to evaluate the effectiveness of a treatment program by reviewing existing data regarding offenders who are participating in MAT that includes the opioid antagonist naltrexone, other supplemental medications, and cognitive behavior therapy in a therapeutic community inside a correctional setting. The participants of this program were offenders who were criminal justice involved and had a diagnosis of substance use disorder. Variables such as cognitive behavioral therapy combined with pharmacological interventions such as supplemental medications and an opioid antagonist were evaluated to determine whether there was a positive correlation between those variables and long-term recovery. I sought to determine whether this pharmacological intervention combined with supplemental medications, instruction on the holistic approach, and treating an offender from a disease model perspective (i.e., nutrition, mindfulness, overdose education, Narcan education and administration, etc.)

was significantly correlated with sustainable addiction recovery by improving overall physical and mental wellness.

## Research Question(s) and Hypotheses

Most of the research regarding substance use disorder and treatment programs during incarceration measured success by recidivism rates but did not consider or measure concepts such as changes in perspective, increases in dopamine levels and overall brain health, and other indicators of success such as maintaining community appointments, continued participation in treatment, and successful life skills such as effective parenting, maintaining stable housing, or securing employment. These metrics were included in the outcome measures collected by the facility and could be assessed. The secondary analysis for this study addresses the following research questions:

RQ1: Does the utilization of naltrexone effectively treat substance use disorder when operated within a residential substance abuse therapeutic community and coupled with cognitive behavioral therapy and MAT?

RQ2: What differences can be measured from the initiation of a comprehensive, holistic MAT program to its successful completion?

Locating an effective MAT program that includes an opioid antagonist with other supplemental medications and is combined with evidence-based treatment such as a therapeutic community and cognitive behavior therapy was the initial step in this study. Once I began reviewing the literature, I discovered there were gaps in the literature regarding MAT programs using an opioid antagonist coupled with a holistic approach operating in a correctional setting. There was a need to evaluate the MAT program in

Virginia correctional facilities to evaluate the effectiveness of using opioid antagonists in treatment and determine whether this could be beneficial in other correctional facilities. It became evident that there was an additional need to evaluate this programming and establish a research project to evaluate the effectiveness of using opioid antagonists in treatment to determine whether this could be beneficial if replicated in other correctional facilities. Because this program was a direct result of federal funding that had been provided to the state of Virginia in the form of grant funds to provide MAT, there was an expectation that outcome measures would be consistently collected and submitted to the grant monitor as set forth by the conditions of the award.

The research design was quantitative and experimental in nature. I investigated use of an opioid antagonist, other supplemental medications, cognitive behavior therapy, and other evidence-based practices by collecting data and relevant evidence to determine whether these variables increased the likelihood of sustained, long-term recovery. The hypothesis for this research was that there would be a positive impact on the participants who successfully completed this MAT program as evidenced by the differences in scores on HAM-A, HAM-D and brain gauge. The hypothesis would be tested by evaluating the participants severity of symptoms of anxiety and depression utilized the evidence-based testing instrument prior to the program and after successful completion to determine what differences could be identified. Similarly, there would be a brain gauge administered before the MAT program and following successful completion to determine what differences could be identified in overall brain function.

$H^1$ There is a relationship between this MAT program and success as indicated by the scores pre- and post-treatment. Specifically, there is a decrease in symptoms of anxiety and depression following successful completion of the program.

$H^o$ There is no relationship between this MAT program and success as indicated by the pre- and post-treatment. There will be no decrease in symptoms of anxiety and depression following successful completion of the program.

$H^2$ There is a relationship between this MAT program and success as indicated by the scores pre- and post-treatment. Specifically, there is an increase in overall brain function following successful completion of the program.

$H^\circ$ There is no relationship between this MAT program and success as indicated by the pre- and post-treatment. There will be no increase in overall brain function following successful completion of the program.

Participant selection in the program evaluated was based solely on individuals' medical stability, prior substance abuse history of primarily alcohol and opiates, and willingness to seek treatment. The participants consisted of both court-ordered and volunteer offenders, and the selection was being conducted by the program coordinator and medical director at the facility. A physician oversees the MAT program and controls the introduction of these medications and treatment modalities based on diagnostic and clinical screening.

In addition, I used a quantitative approach to measure differences in the scores from validated instruments during the program's operation to ensure the efficacy of the program. The study was experimental based on the random selection of participants who

had an equal opportunity to enroll as long as they were medically stable. I completed a secondary analysis of the performance measures submitted to the VDCJS.

Secondary analysis of these performance measures assisted me in answering the research questions. Each quarter the VDCJS gathers performance measures that range from feelings of hopefulness and pride to completed appointments for community resources after incarceration (Russell, 2020). In addition, there is a cortical-metric brain scanner that participants use at the onset of the treatment program and again after successful completion of the program, which measures activity, reaction time, and overall brain health (Powell et al., 2021). This instrument is a medical device approved by the FDA and is compliant with 21 CFR 882.1470 (Computerized Cognitive Assessment Aid, 2020; Powell et al., 2021). Brain scan information is incorporated into the performance measures submitted to the VDCJS by the program coordinator of the MAT program. After the end of every quarter, the data are collected, compiled, and submitted to VDCJS by the program coordinator. I accessed the data and performed the secondary analysis.

## Theoretical Framework

Because this study approached addiction from a social constructivist, conceptual perspective, there was consideration of positivist or biological theories that seek to discover causes of crime, which may be more organic and support the assertion that emphasis should be placed on treatment rather than punishment (Rafter, 2008). Theories that focus on eugenics and biology have evolved since the arguments based on Darwinism of Cesare Lombroso to the present focus on bio criminology, which includes neuroscientists who specialize in brain function (Rafter, 2008). Further, the brain is a

focal point for addiction treatment, and naltrexone is used as an opioid antagonist, which means it blocks the dopamine receptors and serves as a medical intervention in recovery (Ludwig & Peters, 2014).

In addition, there needs to be some consideration given to the sociological theories, specifically social learning (Schmalleger, 2020). Criminological theorists such as Sutherland, Burgess, Akers, and Bandura sought to explain criminal behavior through social learning theory (Akers, 2000). They theorized that human behavior is learned, and they used the central concepts and principles of modern behaviorism. They also believed that behavior is learned through operant conditioning, imitation, or modeling of others. According to Akers (2000), the form the behavior takes and the frequency of recurrence depend on the result of the effects, outcomes, or consequences it has on an individual's environment. Social learning theory focuses on crime and social processes, specifically reinforcement and punishment. Behavior is reinforced when its consequences or the reactions of others encourage an individual to do the same thing again when confronted with similar circumstances.

It was important to examine substance abuse in the context of this theoretical perspective. If an individual is raised in an environment in which drugs are prevalent and the sale of illegal substances is a means of financially supporting family members, substance use would be more widely accepted as a way of life. If an individual has suffered abuse or trauma and has not sought or been provided with effective treatment and counseling, they may abuse substances to escape the pain they experience (Foster, 2018). Under these circumstances, the individual will not be shamed or perceived in a

negative manner because the behavior is normal. Incarceration is not an embarrassing or life-altering experience in these scenarios but rather is seen as an inevitable break in the criminal and self-harming behavior.

Operating under both biological and social learning theoretical frameworks, I examined the manner in which a holistic approach to an individual's substance use disorder impacts recovery. When looking at addiction from a biological perspective, finding the pharmacological and evidence-based curriculum that can change neuropathways and negative, criminal thinking is essential (Schmalleger, 2020). The Brain Gauge is the primary tool used to measure changes in the brain prior to treatment and at the conclusion of the program. Biological theorists argued that the brain is central to an individual's personality and subsequent behavior (Schmalleger, 2020). Clinicians treating substance use disorder argue that there is a need to repair the networks in the brain and rewire neural pathways that have been established through addiction (Ersche et al., 2020). To promote resiliency and sustained recovery from addiction, the brain must be a focus of treatment modalities (Ersche et al., 2020).

Based on the social learning theory, there is a flawed mindset that exists in a person that leads them to abuse drugs, and the behavior that was modeled contributed to or did not discourage maladaptive behaviors (Schmalleger, 2020). The individual may have shame, trauma, or any of many other causes. Abstinence alone will do nothing to end the addiction cycle. There must be a relearning of prosocial behaviors and healthy coping skills taught (Kennedy, 2021). Positive consequences (reduction of cravings), therapy, trauma-informed care, and evidence-based programs such as cognitive

behavioral therapy and changing offender behavior are invaluable in changing criminal thinking**.** Curricula such as cognitive behavioral therapy and changing offender behavior are intended to address not only the individual's peer groups, behaviors and reactions, and skill building but also their ability to reason and critically think through problems and issues to achieve a positive, constructive outcome (Schmalleger, 2020).

Criminal and delinquent lifestyles and routine activities can be evaluated and applied to offender decision making (Maxfield, 1987). In recent years, there have been significant advancements in social science research including better measurements of behavior and criminal thinking, and links and patterns of lifestyle and offender behavior (Maxfield & Babbie, 2018). Further, secondary analysis including different types of statistical regression and other testing has proven an effective manner in which to review the quality of a treatment.

## Nature of the Study

This study was quantitative and experimental in design and was conducted to measure the effects of holistic treatment to improve long-term recovery success when using a MAT program with pharmacological interventions such as naltrexone and other medications that increase dopamine and reduce cravings. The participants in a MAT program at a regional correctional facility were being treated, and psychiatric and medical screenings that were part of the treatment objectives and quarterly reports were reviewed and analyzed to answer the research questions. Research being conducted with vulnerable populations, including incarcerated people, is scrutinized for good reason and was considered at length by me. The initial data collection was conducted after consent

waivers were signed and participants were ensured of their anonymity in the quarterly reports. The information submitted each quarter to the VDCJS did not include any personal identifying information. I verified with each report that anonymity was maintained and verified that there was no PII. The appearance of vulnerability should not lead to a presumption that a person is incapable of giving valid informed consent. Secondary analysis of data carries no potential for harm or ethical issues. Nothing regarding this study caused harm to the individuals who were participating in the program.

## Potential Sources of Data

To examine the impact, if any, of the MAT program on the incarcerated population, I analyzed data using the quantitative method. Throughout the course of the MAT program, which typically lasts 90 to 120 days, the offenders have regularly scheduled appointments with medical and psychiatric professionals to discuss their progress, mental and physical health, cravings, and more. During those appointments, chart notes are recorded and compiled, as required by regular procedure, and are codified to be submitted on a quarterly basis to the VDCJS. Second, there are several measurement tools that are part of the therapeutic community operations, cognitive behavior therapy curriculum, and treatment.

In 2017, the Virginia General Assembly included language in the budget bill that required local and regional jails to administer a brief jail mental health screen to each offender committed to a correctional facility in the state (Schaefer, 2017). Developed by the Policy Research Institute and validated by the Department of Behavioral Health and

Development Services, the screen evaluates those received into a facility in the first 72 hours of incarceration for signs of serious mental illness (Steadman et al., 2005). The initial hours of incarceration are stressful, and these screenings are an attempt to identify an individual's symptoms to determine whether they may be in crisis or have emergent mental health needs. Every offender is administered this screening, which asks the offender about suicidal ideations, attempts, and substance abuse (Steadman et al., 2005). That screen becomes part of their institutional record and is reviewed by a registered nurse who administers an intake physical within 4 hours of committal to the jail (Russell, 2020).

An intake physical includes questions regarding prescribed medications and the administration of a correctional jail mental health screen that is gender specific. This mental health screen is used to inform housing decisions, treatment recommendations, and medical and psychological follow-up. This tool completed at committal provides a baseline score for the offender, which serves as a comparison to the smaller subsection of offenders regarding the mental health and substance abuse needs of incarcerated people. As part of the performance measures required by VDCJS, participants who are enrolled in aftercare services receive a second correctional jail mental health screen upon their intake to a treatment provider in the community (Russell, 2020). This is stipulated in the memorandum of understanding between the jail and the community service providers, and it is standard practice for community providers to determine what level of treatment is required by the patient. That score is recorded and compared with the initial screen to

determine what, if any, differences exist after incarceration or after treatment (Russell, 2020).

A biopsychosocial evaluation is completed on each offender who enrolls in the therapeutic community. Although there is not a numeric score attached to this open-ended interview, data is collected to identify similarities and differences among individuals who participate and successfully complete MAT. These data were not included in the current study because they are qualitative. There is an additional tool developed by the Institute of Behavioral Research at Texas Christian University entitled Criminal Thinking Scales, which was designed for the offender population to measure six areas: entitlement, justification, personal irresponsibility, power orientation, cold-heartedness, and criminal rationalization, all of which represent concepts with special significance in treatment settings for offenders (Knight et al., 2006).

In addition to these testing instruments, the subjects were administered a cognitive test called The Brain Gauge, which has been listed as a medical device with the FDA and is compliant with 21 CFR 882.1470 (Computerized Cognitive Assessment Aid 2020). Brain Gauge is a cognitive assessment tool that measures brain health by testing sensory perceptions in the fingertips. The test measures eight essential components of brain health: speed, focus, fatigue, accuracy, sequencing, timing perception, plasticity, and connectivity. The test provides a comprehensive mental fitness score that is referred to as a cortical metric. The participants took this test prior to the MAT program and following successful completion. The test provided data regarding the impact this programming had on overall brain health. This instrument is noninvasive and uses the proven relationship

between the sensory nerves in the fingertips and the projection of those nerves to corresponding areas of the brain (Powell et al., 2021). The device used at this facility is a mouse-size device (similar to a computer mouse) that uses vibration patterns to determine types of cortical functioning (Favorov et al., 2017). The software guides the user through a variety of questions and tests that increase with difficulty based on answer patterns (Favorov et al., 2017).

This testing instrument measures components of brain health, and the normal range for each of these metrics is 80–100. Speed is defined for the purposes of this test as how quickly the participant can detect changes overall. Focus is defined as the ability to concentrate on the task at hand. Fatigue is defined as how quickly the brain tires during a mentally demanding task. Accuracy is the participant's ability to differentiate between similar sensations or stimuli. Sequencing, also known as temporal ordered judgment, is the brain's ability to keep track of the order of events. Timing perception is similar in that it is the brain's ability to keep track of time. Plasticity, in the context of this test, refers to the ability of an individual to reach and adapt to changes in their surroundings. Finally, connectivity refers to the way different regions of the brain are able to coordinate and communicate.

Each of these testing instruments had been validated and was therefore statistically sound and constructive in quantitative research. There was a collaboration agreement between me and the superintendent of the WVRJ that operates the therapeutic substance abuse community. The research was not an additional intrusion on the custodian of the medical records or health services administrator because they were

already gathering these data for a grant-funded project through the VDCJS. All personal identifiers were eliminated. Participants had already signed releases consenting to access to their medical records for the purposes of evaluating the effectiveness of the program components. The VDCJS collected the data each quarter from the facility, and I analyzed that data.

I originally intended to use a multiple regression analysis on the software platform Statistical Package for Social Scientists (SPSS), to determine what, if any, correlation exists between MAT participation, cognitive behavior therapy, a comprehensive holistic approach, and positive results. The null and alternative hypotheses would have been the following:

$H_o1$: There is no relationship between this particular treatment and long-term substance abuse recovery success as indicated by the scores pre- and posttreatment.

$H_a1$: There is a positive correlation between this particular treatment and long-term substance abuse recovery success as indicated by the scores pre- and posttreatment.

I determined that multiple regression was appropriate because the goal was to determine whether changes in the independent variables (MAT program components) impact the dependent variable (recovery; see Frankfort-Nachmias & Leon-Guerrero, 2018). Regression analysis seemed appropriate because the performance measures included responses that would illustrate the relationship between success and ordinal response variables (Frankfort-Nachmias & Leon-Guerrero, 2018). However, I determined during the data collection phase that a paired-sample *t* test would be more appropriate based on the sample size. A paired-sample *t* test is used to measure a variable at two

separate times, which was ideal for the current study (see Frankfort-Nachmias & Leon-Guerrero, 2018). Statistical analysis was completed on three separate pre and posttests: HAM-A, HAM-D, and the Brain Gauge. These scores were assessed prior to treatment and after successful treatment completion to compare the effect on the overall health of the offenders.

The paired sample *t* test is used to determine whether there is a difference between pairs of measurements (Frankfort-Nachmias & Leon-Guerrero, 2018). The differences should be normally distributed, and there is an assumption that the subjects are independent from one another (Frankfort-Nachmias & Leon-Guerrero, 2018). Although success in recovery is a broad and subjective concept, the performance of these *t* tests was assumed to be an indication of progress. Determining the level of significance between pre- and posttest scores, and thereby the effect of the components of the MAT program on the offenders' long-term recovery success, may inform future policy and program guidelines by recognizing the most influential components.

## Definitions

*Addiction* is a chronic relapsing disorder including repeated exposure and learning, withdrawal, and negative emotions, and compulsive use despite highly adverse withdrawal symptoms (Glasner-Edwards & Rawson, 2010). All addictions involve changes in dopamine reward anticipation circuits in the brain, including eating, pornography, gambling, internet and social media, and reckless spending as well as illegal drugs (Glasner-Edwards & Rawson, 2010). Addiction treatment must address the significance of the brain and its chemicals to be effective.

A tool for baseline evaluation prior to acceptance or recommendation into MAT or other treatment programs includes a *biopsychosocial evaluation*. Biopsychosocial evaluations include an interview with the patient prior to treatment and assesses biological, psychological, and social factors that can be contributing to the problems leading to their substance abuse or criminality (de Jonge, et al., 2001). Biopsychosocial evaluation is considered a whole person, holistic tool to provide a counselor or clinician with a full view of an individual. The premise is that problems do not typically occur in a vacuum; there are numerous factors impacting the individual and their circumstances and decision making. A treatment provider cannot address only the biological causes, such as a genetic predisposition, chronic pain, or addiction, because the environment and personal history are also impactful. The biological portion of this assessment asks questions regarding not only genetic and medical issues but also developmental milestones and physical characteristics (de Jonge et al., 2001). The psychological portion of this assessment includes questions about an individual's mental status, thoughts, behaviors, feelings, and emotions, as well as any trauma or abuse they have experienced (de Jonge et al., 2001). Finally, the social portion of the assessment asks questions about the patient's family relationships (current and past), friendships, and peer group, as well as inquiries on various topics such as church affiliation, quality of marriage, and work-related stress (de Jonge et al., 2001).

*Buprenorphine* is a medication that partially blocks the effects of illegal drugs by binding to the mu receptors in the brain. Buprenorphine is referred to as a partial agonist because it does not fully activate the opioid receptors and has some blocking properties

(SAMSHA, 2020). Although buprenorphine does not create the same level of euphoria or high, it is still an opioid with the same dangers (respiratory distress, physiological dependence, diversion potential). Although there are regulations associated with prescribing this medication, they are not as strict as with methadone, and buprenorphine can be prescribed by physicians who have completed a training course and waiver (SAMSHA, 2020).

*Cognitive behavioral therapy* is based on the principle that an individual must recognize the patterns of thinking that lead to criminal behavior. Cognitive behavioral therapy is effective in the treatment of a variety of medical and mental health conditions including substance abuse (Magill et al., 2019). An individual's perceptions are sometimes destructive and unhealthy, and cognitive behavioral therapy helps educate them on their distressing thoughts. Once an individual can evaluate how realistic these thoughts are, they are able to change the distortions and more consistently solve problems and initiate behavioral change (Magill et al., 2019).

*Dopamine* is a chemical in the brain that is commonly referred to as the pleasure or anticipation molecule that releases neurotransmitters and sends messages through memory and emotional circuits (Solinas et al., 2019). Dopamine is a natural chemical that exists in every individual. Increases in dopamine are experienced by nondrug users with favorite foods, sex, exercise, and other enjoyable, natural experiences. However, nothing occurs in nature like synthetic drugs, and addiction corrupts this natural reward system (Solinas et al., 2019).

With the rise of opioid overdoses, an additional focus has been placed on *harm-reduction strategies*, which seek to minimize the negative consequences associated with drug use while recognizing that abstinence may not be a realistic goal. Typically, this includes needle exchange programs, education on safer use practices, peer support and counseling, and expanded access to health care services (Hawk et al., 2015).

*Medication-assisted treatment (MAT)* is one option for patients seeking treatment for substance use disorders, especially opioids and alcohol. MAT is a combination of medication and therapy used to treat substance use disorders. Effective treatment must target both the physical and psychological effects of substance use disorder, which requires both pharmacological interventions and psychosocial support. This combined approach is recognized by leading agencies such as SAMSHA and NIDA (NIH, 2020). There are three generic medications that are approved by the FDA to be utilized in MAT: methadone, buprenorphine, and naltrexone.

*Methadone* is a medication that substantially blocks the effects of illicit drugs by binding to the mu receptors in the brain. Methadone is referred to as an agonist because it fully activates the dopamine reward system in the brain so the patient will not experience withdrawal symptoms. Methadone is an opioid that can create physiological dependence and allows the patient to attain a high (SAMSHA, 2020). Clinicians must be aware that this medication can cause respiratory suppression as with any opioid, and there are strict federal guidelines for how this medication can be dispensed.

An additional harm reduction strategy includes *naloxone* (generic name for Narcan), which is an opioid antagonist that can quickly reverse the effects of opioid

overdose (Lai et al., 2021). When someone overdoses on opioids, they often experience respiratory distress in which their breathing becomes dangerously low or ceases (Lai et al., 2021). Naloxone works by binding to the same opioid receptors and displacing them quickly, restoring normal respiratory function (Lai et al., 2021). Peer groups and families who routinely abuse opioids should possess this medication to prevent fatal overdoses (Hawk et al., 2015). This medication is readily available at this time and distributed in some localities at no cost.

*Naltrexone* is a medication that blocks the receptors in the brain by binding completely to the mu receptors. Naltrexone is referred to as an antagonist because it does not activate the receptors and does not provide stimulation to the dopamine reward system (SAMSHA, 2020). Naltrexone does not create a high or have overdose or diversion potential. Naltrexone can be prescribed by any provider because it is not an opioid. However, prior to taking the medication, a patient must complete detoxification to ensure no adverse side effects.

*Opioid abatement* is a strategy that is focused on the reduction of the harmful effects of substance abuse, specifically opioids, and addiction within a particular population (Opioid Abatement Authority [OAA] 2023). The primary goal of opioid abatement is to decrease the devastating effects of this public health crisis including the cycle of addiction, its impact of users and their families, overdose deaths, and the overrepresentation of individuals with substance use disorder in the criminal justice system (OAA, 2023). Abatement refers to a multifaceted approach that includes interventions such as harm-reduction strategies, expansion of treatment, education

programs for users and prescribers, prescription drug monitoring programs, and MAT programs (OAA, 2023). The most critical aspect of opioid abatement is the collaborative approach to address the problem of addiction that requires an innovative approach to treatment in numerous settings.

*Pharmacotherapy* in terms of MAT includes medications such as methadone, buprenorphine, and naltrexone. These medications are used in conjunction with evidence-based treatment programs such as cognitive behavioral therapy to replace addiction and criminal thinking with healthy pleasures and productive thoughts.

Although drug addiction and treatment are widely discussed in the news and policy discussions, it is important that the concepts be clearly defined. First, *substance use disorder* is defined by Diagnostic and Statistical Manual of Mental Disorders (fifth edition) as the maladaptive use of substances that continues despite negative consequences or problems that result (Connery, 2014). Substance use disorders vary as much as the individuals who suffer from them, but a diagnosis can be determined using 11 criteria over a 12-month period: taking an excess of a prescribed medication or in a manner not consistent with the prescription; having a desire to not use the substance but be unable to cease use; spending unreasonable amounts of time obtaining, using, or recovering from the substance of choice; the presence of cravings and urges to use; not managing to complete tasks, meet responsibilities (work, school, etc.) because of the substance use; continuing to use even when it causes harm to personal relationships; giving up social, professional, or recreational activities to use; using substances even when there is knowledge of harm or potential danger; continuing to use despite physical

or psychological damage; building up a tolerance, in other words, requiring more of the substance to have the desired effect; and development of withdrawal symptoms that can only be relieved with use of the substance (Connery, 2014). Physicians determine the extent of the disorder based on the presence of symptoms; whether they are mild, moderate, or severe; and how many of the criteria are present.

A key element in any MAT program is the instruction using an evidence-based curriculum that is provided to patients receiving medications in a structured environment. Correctional programming is beneficial, but there is evidence that a patient immersing themself in a therapeutic community contributes to higher success rates (Rudd, et al., 2016). A *therapeutic community* is a structured environment for changing behavior in the context of community life and responsibility. The primary goal of a therapeutic community is to foster individual change and promote positive growth. This is accomplished by changing an individual's lifestyle through a community of concerned people working together to help themselves and one another. Being part of something greater than oneself is an important factor in facilitating positive growth. Therapeutic communities offer a holistic approach in regard to treating the whole person and not only the addiction. Modifications are made throughout the United States, but the overarching principles hold firm: Addiction is a disorder that impacts every aspect of a person's life, and the whole person must be treated; patients are able to change their behavior and will become productive members of society; and recovery is seen as the gradual rebuilding of a new life that requires changes in thinking, feeling, values, behavior, and self-identity (Moore et al., 2020). There is also a significant emphasis placed on right living, which

includes honesty, responsible concern for others, strong work ethic, and active and continuous learning (Moore et al., 2020).

## Limitations

There was a limitation regarding the results and measurement of success in this study. Although success can be evaluated by measuring different variables, any amount of abstinence from illegal substances will improve overall quality of life. The relatively small sample size of fewer than 100 over a period of 12 months decreased the ability to generalize the results to correctional facilities nationwide. Finally, substance use disorder is a complex and difficult disease that is different for each individual, and relapse is an expected part of recovery. Therefore, the individual scores and statistical results may appear discouraging in the short term.

Limitations exist when utilizing secondary analysis as a methodology such as an inability to control the quality of the initial data collection or research bias (Kiecolt & Nathan, 1985). With this study, there was also a limitation inherent in the testing instrument being utilized. For example, HAM-A and HAM-D measure the severity of symptoms for anxiety or depression before and after the successful completion of the MAT program (Moller, 2001). It is possible that the symptoms could be positively impacted by the program yet scores not reflect that completely based on a circumstance beyond the control of the individual that still impacts them (death of a family member or poor adjustment for child while incarcerated). Additional limitations are addressed throughout the next two chapters.

## Scope and Delimitations

This research set out to determine the effectiveness of a comprehensive, holistic approach to treating substance use disorder in the offender population as well as identify benefits and challenges to MAT in a correctional setting. The study focused on participants in a residential therapeutic community operating in a regional jail who had been diagnosed with substance use disorder (SUD). Participants were provided the same interventions (an opioid antagonist, CBT, supplemental medications) and measured outcomes following successful completion of the MAT program to determine what changes could be observed. Further, the research aimed to determine the most beneficial components that contribute to an effective MAT program to include treatment modalities, implementation of cognitive behavioral therapy and other psycho-social therapies addressing an individual's underlying causes of addiction. This research focused on pharmacological interventions that provide an individual with necessary nutrients that are currently deficient as well as an opioid antagonist to manage cravings. All these components were reviewed within the context of a jail setting where there is a need to maintain institutional order and security.

When considering limitations in social science research, it is imperative that a researcher exercise due diligence to address those to ensure that the results can be viewed as reliable and credible (Brannen et al., 2008). In this study, I set a specific time frame (January-December 2022) for data collection to ensure that the research was feasible and able to be utilized for this dissertation. This study was concentrated on one particular correctional facility in southwest Virginia and therefore, a geographical delimitation

added relevance to the findings (Brannen et al., 2008). Focusing solely on the results of the HAM-A, HAM-D and brain gauge instead of a wider variety of elements ensured that the results not only addressed the specific research questions (scope delimitation) but was based on reliable data sources (Brannen et al., 2008).

## Significance

The research evaluating MAT for substance use disorder within a jail or prison is significant as the opioid crisis continues, and overdose deaths are increasing (Moore et al., 2019). The traditional approaches to reducing recidivism must be re-examined and collaboration among public health and criminal justice is imperative. The percentage of individuals incarcerated with substance use disorder has continued to increase at a much higher rate than the general population (Moore et al., 2019). This population is also at a greater risk for death by overdose following release from incarceration and access to more potent forms of synthetic opioids such as fentanyl (Binswanger et al., 2013). By evaluating the efficacy, benefits and challenges of MAT programming components within a jail setting, this study provides a timely analysis that may impact future correctional policy and practice and inform correctional healthcare practices. Most significant is the opportunity it presents to provide a higher standard of care for the offender with SUD which will hopefully continue after release from custody.

The study's significance also lies in the opportunity to provide jail administrators with a higher standard of care for treatment of SUD in the form of a comprehensive, holistic MAT program that does not include a pharmacological intervention with diversion or overdose potential (Sharma et al., 2016). Through implementation of similar

MAT programs, correctional facilities could not only effectively treat SUD but provide the individual with the tools necessary to abstain from illegal drug use and criminal behavior through psycho-social programs like CBT following release (Carroll & Weiss, 2017). The study has the potential to provide a new "best practice" in substance abuse treatment that has historically focused on maintenance of withdrawal symptoms and harm reduction (Binswanger et al., 2013). The study can provide a way to effectively treat SUD during incarceration and based on its comprehensive treatment modalities, improve overall physical and mental health of the individual to increase the likelihood of success when they return to the community. This study has the opportunity to improve treatment outcomes for the individual with SUD who is incarcerated but the overall positive social change will come after release when they are able to re-engage with their families and maintain the stability that comes with abstinence.

## Summary

This initial chapter focused on the overview of opioid addiction as a public health crisis and the overwhelming need to provide effective intervention to individuals who are incarcerated. The definitions were provided to clarify some of the finer points of MAT, the pharmacological interventions and their differences, and the other components of the programming needed to understand the scope of this study. The MAT program allows for comprehensive treatment of offenders with substance use disorder by addressing their physical, psycho-social, nutritional, and psychiatric needs. Substance abuse and opioid-related death have become a compelling crisis, and incarceration alone is not effective. Mandating programs such as MAT is essential to reduce recidivism and provide

individuals suffering from substance use disorders a real opportunity to be successful in recovery. I conducted a secondary analysis of data to determine whether a pharmacological intervention combined with supplemental medications and instruction on the holistic approach that treats an offender from a disease model perspective would be a significant treatment modality to achieve sustainable addiction recovery and reduce recidivism. Findings may be used to inform criminal justice practitioners as they consider incorporation of MAT into correctional facilities.

# Chapter 2: Literature Review

The current opioid epidemic includes a treatment-not-punishment message while focusing on substance use disorder as a disease instead of a choice. MAT appears to be the primary evidence-based response that makes it likely to be at the core of criminal justice reform. Studies suggested that continuation of MAT programs in outpatient programs, jails, and prisons increases the likelihood that individuals will continue MAT following any court mandate or probation, thereby decreasing the risk of death due to overdose and recidivism due to high-risk behaviors (Kinlock & Schwartz, 2009). In a recent study of over 150,000 National Health Service patients treated for opioid dependence followed for a total of 442,950 patient years, treatment of opioid dependence with MAT medications was found to reduce risk for opioid death by one half compared to patients with no treatment or psychosocial treatment (Oesterle et al., 2019). Almost any amount of participation in MAT adds a meaningful chance of improving patient survival. The association between treatment and improved survival is due to numerous factors including reduced risk of infection, improved social functioning, reduced criminality, and establishment of long-term contact with health care professionals (Oesterle et al., 2019). Decreasing IV drug use is an indirect benefit of this program, which prevents the spread of hepatitis C and HIV. Over 60% of heroin users who participated in MAT were abstinent 1 year after treatment (Teesson et al., 2006).

## Literature Review

In order to develop an understanding of MAT program components and their efficacy in addressing SUD within jails and prisons, a comprehensive search of current

literature was completed. This included searching through library databases at major universities with the assistance of reference librarians to ensure the search was fruitful, scholarly resources utilized in both academic and healthcare settings as well as Google Scholar. The key terms included “medication assisted treatment,” “opioid antagonist,” “methadone,” “suboxone,” “cognitive behavioral therapy,” and “substance abuse treatment in correctional settings.” The search generated a variety of journal articles, previous studies conducted, reports from public health and criminal justice agencies and research on all aspects of addiction. These resources were written from varying perspectives, some simply communicating the seriousness of the opioid crisis and its disproportionate impact on those who are justice-involved to others specifically recommending a particular pharmacological intervention. Other resources, directed at corrections, argued for the consideration of withdrawal symptoms and need for medical intervention for this population to prevent negative outcomes, decrease liability and promote a higher standard of care.

The literature review contains numerous sources that are beyond the recommended 5-year expectation for academic works. The value of that standard is critical in ensuring relevance and quality of product. However, there were instances in this process where it was necessary to review and cite sources that extended past that range based on the limited body of research available on the combination of MAT and SUD during incarceration. It is valuable to present in the literature review that it was necessary to include articles dating back to 2002. This is pertinent since they are an accurate representation of the lack of current research on the subject matter. While the

academic process calls for the gathering of the most current research in the field of study, including these older sources demonstrates the significance of investigating MAT programs within the criminal justice system.

According to the American Jail Association (AJA), which is responsible for granting numerous agencies accreditation if they are adhering to national best practices, vulnerable populations who are criminal justice involved are in an ideal setting to participate in MAT (AJA, 2021). Correctional practices should address substance use disorders during incarceration. L. Brinkley-Rubinstein et al. (2017) found that implementation of MAT in a correctional setting supported the purpose of the current study and provided data to support the significance of the research problem. Ludwig and Peters (2014) found that MAT in a correctional setting is an ethical issue that must be addressed by administrators. Ludwig and Peters indicated that limiting access to MAT has ethical implications and identified five leading elements (capacity, disclosure, understanding, voluntariness, and access) typically used as arguments against implementation. Lastly, J. Neale et al. (2018) highlighted the value of peer groups and support in a therapeutic setting and the positive impact those factors have on long-term recovery.

There have been reviews done regarding the opioid epidemic globally. In Australia, Lin et al. (2018) determined that there is a lack of knowledge among health care providers when implementing MAT. Lin et al. recommended education both on MAT as a treatment option as well as opioid misuse and outlined prescription monitoring programs and their benefits. In addition, Blum et al. (2018) found that the use of FDA-

approved medications helped patients remain compliant and abstinent of illegal drugs over time.

Adelson et al. (2018) compared similar treatment of individuals in in-patient treatment facilities in Tel-Aviv and Las Vegas. This study found that there was a higher incidence of retention and successful outcomes in patients from Tel Aviv than Las Vegas and recommended further evaluation to determine what led to that disparity in similar treatment programs. Studies were also reviewed from Malaysia and Canada but focused more on the stigmatization of addiction, cultural biases, compulsory versus voluntary treatment, and other barriers to MAT (Khan et al., 2018).

In reviewing the current literature, I identified a gap in correctional settings using an opioid antagonist rather than other medications. Further, there were a variety of definitions of MAT. Technically, any clinical use of pharmacological interventions that address withdrawal symptoms is MAT. Correctional administrators have considered the intervention used in detoxification protocols or the use of a partial agonist with pregnant females as MAT. There was a need for a comprehensive approach that included several different medications as well as cognitive behavioral therapy.

I reviewed publicly available government reports, technical papers, and peer-reviewed articles that discussed the efficacy of RSAT programs and provided descriptions of key components of RSAT. This included a national search as well as programs in the Commonwealth of Virginia, and specifically Southwest Virginia and the New River Valley. RSAT is considered an intensive form of treatment for individuals with substance use disorders who have co-incidence of crime. This therapeutic treatment

occurs in a highly structured environment where participation in meetings and appointments with clinicians and groups and individual therapy is expected to successfully complete the program. RSAT provides intensive care for individuals with severe and complex substance use disorders in a substance-free environment with 24-hour support in a residential setting separated from the general population of a correctional facility. In the prison system, there is an additional level of restriction based on judicial orders and treatment with trained professionals in a controlled environment.

The key components of the RSAT program are residential treatment that is separate from other inmates, targeted substance abuse treatment, counseling, or behavioral health, cognitive, social, vocational, and other skills targeting the substance abuse problem and related problems. Monitoring is included via urinalysis or reliable forms of substance use assessment. In addition, aftercare services are encouraged for RSAT programs. The Bureau of Justice Assistance (2005) recommends that aftercare services "must involve coordination between the correctional treatment program and other human service and rehabilitation programs, such as education and job training, parole supervision, halfway houses, and self-help and peer support groups, which may help in rehabilitating offenders" (p. 4).

When RSAT programs were evaluated in the first 6 years after they had been established, 56 states and territories received RSAT funding (Stainbrook et al., 2017). Many programs used a competitive application process to determine what RSAT programs would be funded. The Department of Corrections is responsible for distributing funds in some states, and the remaining states have no bidding process because they

usually fund the same programs every year (Stainbrook et al., 2017). States are given preference for funding when they include prerelease treatment that involves coordination of services between the correctional treatment program and other human service and rehabilitation programs. Programs such as education and vocational training, aftercare services, counseling, continued medication, and job placement are elements that may fulfill these requirements. However, few programs report using RSAT funds for aftercare (Stainbrook et al., 2017).

## Sequential Intercept Model

The Sequential Intercept Model (SIM) is a conceptual framework developed by Mark Munetz and Patricia Griffin to guide the identification and intervention of individuals with mental disorders, to include substance use disorder, who become involved in the criminal justice system. The model identifies five sequential points, or intercepts, at which different interventions can replace excessive incarceration and towards appropriate and beneficial treatment and support.

This model, which is widely used throughout the United States, identifies five sequential points as follows: (Intercept 1) Community-Based Crisis Intervention is the first intercept and involves identifying individuals with mental health or substance abuse needs in the community who may be in crisis. This initial intercept aims to provide early intervention and prevent unnecessary involvement with law enforcement. Mobile crisis teams, crisis hotlines, drop-in centers or emergency rooms are all examples of interventions at this intercept. (Intercept 2) Law Enforcement and Emergency Services is the second intercept which focuses on those interactions with first responders. It aims to

improve the identification of mental health needs and provides alternatives to incarceration. Services can include specialized mental health response teams, Crisis Intervention drop-in centers, diversion programs and crisis intervention training for law enforcement and correctional officers.

Following the first two intercepts, the SIM enters the criminal justice system. (Intercept 3) The third intercept is Initial Detention and Court Hearings who are entering the criminal justice system post-arrest. The goal is to ensure that individuals receive appropriate mental health assessments and support during the pretrial phase. This may include mental health screenings, both ones mandated by the state or accreditation agency and more in-depth clinical and psychological screenings, access to mental health and clinical professionals, detoxification protocols and identification of special needs during the pre-trial phase. (Intercept 4) Jails and Courts comprise the fourth intercept on individuals who are incarcerated. The goal is to provide treatment and support within the jail or prison facility to address underlying contributing factors that directly correlate to deviant or criminal behavior. This intercept is where MAT programs can be utilized and proven beneficial as well as specialty treatment courts (drug and veteran courts, mental health dockets) and re-entry services. In addition, at this point in the model, there is an emphasis on the collaboration between community services, advocates, mental health and substance abuse treatment services and criminal justice professionals.

The last intercept, number 5, is Community Corrections and Reentry involves individuals who are returning to the community following release from incarceration. The focal point is continuity of care and providing supportive services within the community

that will assist the individual in pursuing a law-abiding, pro-social and healthy lifestyle. This can include practical services such as transportation or housing, assistance for securing basic needs such as restoration of operator's license, completion of high school diploma or equivalency or financial resources to pay fines and costs. It is also important during this intercept to assist the ex-offenders to secure employment which is a consistent challenge for returning citizens.

The Sequential Intercept Model provides a framework for collaboration and coordination between service providers and the criminal justice system. It promotes the idea of diverting individuals with disorders from unnecessary incarceration and potentially causing more harm and instead, providing appropriate intervention and supportive services at key points along the criminal justice continuum. By providing intervention at these stages, communities can strive to improve outcomes with individuals with mental health needs and substance use disorder and promote resiliency and eventually quality of life for everyone involved.

## Corrections: A Historical Perspective

After the Civil War, southerners faced the task of rebuilding their community and economy and there was no money to build more facilities despite the increasing prison population. In response to those challenges combined with the fact that there was a large inmate labor force and states' need for revenue, the lease system and penal farms were created (Lemley, 2006). These dominated southern penology at the time while western penology deemed the care of the convicts a responsibility of the lessee (Lemley, 2006). Towards the end of the 1800s, a new generation of reformers emerged. Like the Quakers

before them, they were focused on humanitarian concerns like removing the silence and isolation and other practices that were viewed as harmful (Lemley, 2006). However, there was a fundamental belief that prison and criminal sanctions were necessary to promote law and order but that there should be a change of focus: inmate rehabilitation (Clear et al., 2006).

The Elmira Reformatory in New York and practitioners like Enoch Wines and Zebulon Brockway led the charge to implement rehabilitative services (Clear et al., 2006). At this time, there was an initiation of correctional practices that remain in place currently such as diagnosis and treatment of underlying conditions, classification processes and individualized plans for rehabilitation to include work, medical or education services (Clear et al., 2006). This classification process was the initial recognition of the significance of investigating an offender's circumstances and risk factors that led to their criminal behavior.

In the beginning of the 20th century, the positivist school of thought was introduced into the penal system. These progressives felt that criminal behavior was something that was beyond an individual's control. Instead, it was based on biological factors, psychological maladjustments, and sociological factors that, if treated, would allow them to be otherwise law abiding (Clear et al., 2006). Treatment became one of the primary goals of the criminal justice system and not solely punishment. Other reforms that came about during this period were the creation of probation as an alternative to incarceration and indeterminate sentences (Lemly, 2006).

The medical model emerged shortly after, in the 1930s, when rehabilitation gained momentum and there became a renewed focus on behavioral and social sciences (Lemly, 2006). Beginning when Congress authorized the Federal Bureau of Prisons to open institutions that would engage in proper treatment, care and classification of offenders with the assistance of correctional staff (Lemly, 2006). For the first time, 'staff' included not only security personnel but social workers, medical professionals to include psychiatrist and educators. Under the medical model of penology, crime was viewed as a manifestation of deficiencies within the offender-biological, psychological or social (Lemly, 2006). In response to a rise in crime rates in the late 20th century, the ideology of the medical model and progressives gave way to the crime control model. There was a renewed focus placed on determinate sentences, especially for those offenders convicted of violent crimes and habitual offenders (Clear et al., 2006). Opponents of rehabilitation cited high recidivism rates and overarching discretion as justification for a change in correctional practice (Clear et al., 2006). When crime rates reached their highest peak in the late 1970s, early 1980s, judges and government officials responded with a series of determinate sentencing guidelines and abolition of parole for some offenses (Lemly, 2006). Rehabilitation, under the crime control model, was a privilege afforded to volunteers instead of remaining the focus of corrections. The resulting situation led to a wider net of individuals being jailed, significant increase in jail and prison populations with offenders spending more time incarcerated and fewer opportunities for treatment (Lemly, 2006).

## Corrections in the 21st Century

At present, jails and their staff must manage a wide variety of offenders who present with numerous issues, ranging from medical or psychological to illiteracy and victimization. These challenges are passed on to the correctional administrators who are compelled to manage a wide range of issues. Offenders, specifically those with mental illness and substance abuse co-occurring, present with complex conditions requiring both medication and specialized treatment to resolve but may lack the desire or the ability to participate effectively in their own care (Hanser, 2017). Jail staff and administrators must manage those complex medical and mental health conditions while maintaining the safety and security of all those incarcerated, some of which are physically healthy but incredibly aggressive and violent. Offender typologies, problems and issues present considerable challenges for correctional administrators (Hanser, 2017). This combined with the fact that there is typically not adequate funding or staffing levels in most facilities makes it a difficult situation not easily resolved.

As a nation, the United States incarcerates 639 per 100,000 people: the highest in the world (Prison Population, 2021). In 2016, there were 1.5 million offenders incarcerated in state or federal prisons (Prison Population, 2021). These high incarceration rates have led to an abundance of challenges for correctional administrators. The mission of corrections is to supervise criminal offenders during the time of their incarceration, protect the public and offer programs that assist in their rehabilitation. While that mission may seem simplistic, corrections personnel must manage every need for the offender population they serve. This includes everything from food, clothing,

recreation, and educational needs to complicated and expensive healthcare while remaining in a continually shrinking budget. The 21st century offender has complicated medical and psychological needs and addiction to substances is a part of that. Correctional administrators cannot refuse substance abuse treatment to an addict anymore because they may need dialysis treatment for a patient suffering from kidney failure.

While incarcerated, the correctional administration is responsible for the healthcare of the offender population, most of whom have high-risk, difficult medical and mental health challenges. Provision for medical care is considered a basic constitutional right and as such, failure to provide "adequate medical care" amounts to a violation of the Eighth Amendment (Linden et al., 2018). In the landmark case of *Estelle vs. Gamble,* the Supreme Court ruled that "deliberate indifference" to an offender's serious medical needs rises to the level of unconstitutionality (Linden et al., 2018). The standard continues to rule correctional medicine and decision making, stipulating that action or inaction can constitute deliberate indifference if it leads to "unnecessary and wanton infliction of pain" (Linden et al., 2018). Serious medical need is further defined by case law as one having been diagnosed by a physician "mandating treatment" (Park & Friedman, 2014). MAT is considered the most appropriate standard of care for those suffering from opioid use disorder and therefore, it is argued by practitioners that failure to provide those services to individuals who are incarcerated meets the legal standard of "deliberate indifference."

Federal correctional facilities, also known as the Bureau of Prisons (BOP), are responsible for the care and custody of over 175,000 individuals (Government

Accountability Office [GAO], 2020). BOP reports that of those individuals, approximately 20% have been diagnosed with a substance use disorder (GAO, 2020). While these individuals are serving their sentence within the prison, the administrators recognize the need to address their substance use disorder in the same manner that treat their hypertension, diabetes or mental illness. Not only is it important to aid an offender with treatment so they are more successful upon reentry into the community. It is also important to remember that failing to maintain an appropriate standard of care for these individuals rises to the level of deliberate indifference. For this reason, BOP provides drug education programming along with several treatment programs available to individuals housed in federal custody. In 2019, the BOP implemented MAT programming combining cognitive behavioral therapy with the use of medications such as Naltrexone, Buprenorphine and Methadone (GAO, 2020). In a study conducted by the Department of Justice, it identified that in the first year of operation, there were 41 participants in MAT (GAO, 2020). There were recommendations made following a review of the BOP drug treatment programs which indicated the need for expanded MAT services, planning and implementation resources to include additional staff, research on modalities and approximately $76 million over fiscal year 2021-22 to fund these efforts (GAO, 2020). The U.S. Department of Justice (DOJ) Budget Request is available online but there are limited resources beyond that regarding BOP and MAT.

There are references throughout the BOP website to the First Step Act of 2018 and the Second Chance Act. The First Step Act was signed and enacted in an attempt at criminal justice reform that also focused on the importance of public safety

(Congressional Research Services, 2019). There was a provision for the BOP to use a risk and needs assessment on each prisoner to determine what services and programs would be most beneficial and seek opportunities for them to participate in this programming (Congressional Research Services, 2019). There was also a component that reviewed some federal crimes and their penalties and adjusted the sentencing as needed (Congressional Research Services, 2019). The third component of this reform bill included the reauthorization of the Second Chance Act.

The Second Chance Act applies to various parts of the criminal justice system but specifically to substance use treatment by authorizing the DOJ to offer grant funding to prisoners in order to improve current treatment of SUD as well as develop new programming, to include MAT (FBOP, 2021).

The implementation of MAT in state prison systems varies both in medications utilized and treatment modalities. The Rhode Island Department of Corrections provides all three approved MAT medications (Naltrexone, Buprenorphine and Methadone) and assesses their patients for a diagnosis of SUD and enrolls those confirmed (Stammer, 2020). These individuals receive the appropriate medications, individual and group counseling along with reentry services to bridge the treatment gap from incarceration to the community (Stammer, 2020). Individuals in the New Jersey Department of Corrections (NJDOC) are evaluated and if deemed suitable candidates for treatment can be housed in two separate facilities within the NJDOC network and receive specialized treatment services (Stammer, 2020). For these individuals, the treatment is contracted out

to a third party, Gateway Foundation, which provides SUD treatment and all three approved MAT medications (Stammer, 2020).

In the Kentucky and Massachusetts prison systems, there is a focus on relapse prevention as opposed to treatment which guides the use of Naltrexone prior to release from incarceration and provisions for community resources post-release (National Sheriff's Association, 2018). In addition to the medication, patients are provided follow-up services with substance abuse and mental health counselors within the community along with group therapy based on their individual needs (National Sheriff's Association, 2018). Finally, these patients are provided support services along with medication for a period of up to 12 months to encourage continued participation in treatment (National Sheriff's Association, 2018).

There are also MAT programs operating in prison systems in Colorado, North Dakota, Montana and Utah with varying degrees of evidence-based curriculum delivery and some offering of FDA approved MAT medications but none offering all three medications and CBT (Stammer, 2020).

## The Cycle of Addiction

In order to properly evaluate the treatment modalities for substance abuse, the cycle of addiction must first be understood. The addiction cycle is typically described as having seven stages: (1) belief system, (2) impaired thinking, (3) preoccupation, (4) ritualization, (5) compulsive behavior, (6) despair and (7) unmanageability (Volkow et al., 2016). The belief system involves an individual's core beliefs like self-image, respect, how they view themselves in the context of other relationships. An individual with SUD

will typically have a low self-image or believe that they are unworthy, inadequate or that they lack value (Volkow et al., 2016). This unhealthy belief system contributes to the more significant stage of impaired thinking. This impaired thinking causes an individual to think irrationally and changes thoughts, behaviors and attitudes (Volkow et al., 2016). Impaired thinking can include such thoughts as "I have to be high to make it through this activity" or "I can hide my addiction from my loved ones." This impaired thinking takes some time to develop and simple abstinence from their drug of choice does not eliminate it. Preoccupation occurs next which involves thinking constantly about the drug of choice whether the thoughts are about how to obtain them, where to get them from or how much better I will feel when I have them. This stage leads to drug use and if a patient is in recovery, preoccupation leads to relapse (Volkow et al., 2016).

Ritualization is a significant part of the addiction cycle which leads to the treatment mantra referencing that to stay sober, a patient will need to change their "people, places and things." Ritualization is the preparation or procedure an addict will go through to obtain and use drugs. Whether there is a particular individual they purchase them from, going to the place where they hide to use, it is the pattern that has been established and they experience a level of comfort with that routine (Volkow et al., 2016). Compulsive behavior is defined as the repetitive nature of an act or behavior and in the case of an addict, it is the actual drug use. These become irresistible impulses to act, and rationality and motivation are no longer important, thus compulsory (Volkow, et al., 2016). The negative behaviors that accompany drug use can also become compulsive (arguments, lashing out, emotional withdrawal, etc.). The stage following the drug use is

despair which is described as feelings of hopelessness and helplessness. The addict feels even more disgusted with themselves and feel powerless to their addiction which could lead directly back into the initial steps of the cycle (Volkow et al., 2016). The drug use at this point because the solution to escaping those feelings of hopelessness and despair. The final stage is unmanageability, which in this case refers to the manner in which an addict cannot manage their thoughts, money, time, health or well-being. At this stage, they lose their jobs, financial security and relationships break down (Volkow et al., 2016). Individuals that reach this level in the addiction cycle will frequently find themselves involved in the criminal justice system.

## Addiction and Opioid Receptors in the Brain

Opioid receptors are proteins found in the brain and other parts of the body that interact with opioids, which are a class of medications that include prescription painkillers like oxycodone, hydrocodone, morphine as well as illegal, street drugs like heroin. There are three primary opioid receptors: mu, kappa, and delta (Merrer et al., 2009). While an explanation of the neurological complexity of these receptors is substantial, for the purposes of this research project, they are defined as playing a critical role in regulating mood, pain and reward pathways within the brain (Kosten & George, 2002).

When opioids bind to the opioid receptors, they stimulate (or activate) them, leading to a variety of effects. The activation of the mu receptors is primarily responsible for pain relief, thus the prescribing of narcotics such as morphine and oxycodone for acute pain (Pasternak & Pan, 2013). These medications provide pain relief but also

induce feelings of euphoria or ‘high’ which serves as a reward (Kosten & George, 2002). A subsequent and unintentional consequence is that these medications and activation of the opioid receptors in the brain can lead to tolerance, dependence and addiction. The activation of kappa receptors can produce pain relief as well but may also have an analgesic, sedative or dysphoric effect on an individual (Kosten & George, 2002).

These opioid receptors are important for pain regulation and overall pain management can be beneficial but simultaneously harmful. The activation of opioid receptors in the brain can provide effective pain relief which is why they are valuable for managing acute pain (Merrer et al., 2009). Likewise, the activation of mu receptors in the brain can result in feelings of euphoria which encourages repetitive use. Both activations will lead to increased dosage for desired effect and physical dependence and addiction is likely to occur. Repeated activation of these receptors in the brain through abuse where users develop abusive and drug-seeking behavior despite negative consequences (Merrer et al., 2009).

In addition to the likelihood of addiction, there are two additional consequences that can be physically or psychologically harmful. One of which is respiratory distress caused by the activation of opioid receptors in the brain (Pasternak & Pan, 2013). This activation can suppress the activity of the neurons responsible for breath regulation (Pasternak & Pan, 2013). This can lead to respiratory depression or distress which is a concern and could be life-threatening. Opioid receptors are also involved in regulating mood and emotional responses (Kosten & George, 2002). Chronic opioid use can alter or

disrupt the natural balance of chemicals in a person's brain causing mood disorders, such as anxiety and depression (Kosten & George, 2002).

It is important to recognize the highly addictive properties of opioid medications and for physicians to discuss these risks with patients prior to prescribing. Opioids have legitimate medical uses and can provide effective relief for patients suffering with acute pain (Kosten & George, 2002). However, the abuse of opioids can have a detrimental impact on brain functioning and overall health.

## MAT: A Historical Perspective

While opium had been used throughout history, the development of its full chemical formula coupled with the invention of the hypodermic needle in the 1850s skyrocketed its use by medical providers for a variety of disorders (Oesterle et al., 2019). In the 1900s, there was a recognition of its propensity for abuse and lethality and in 1912, countries around the globe signed the International Opium Convention which restricted the manufacture and sale of morphine (Oesterle et al., 2019). While that should have significantly reduced consumption, the early 1990s brought a push for the medical research community and pharmaceutical industry to treat non-cancer pain. This coupled with reimbursement for physicians and medical facilities for pain control measures and aggressive marketing by drug companies led to a quadruple increase in prescription opioid sales in our nation from 1999-2014 (Oesterle et al., 2019). The reality is that individuals for whom a prescription opioid is clinically indicated, are at tremendous risk for developing substance use disorder. Furthermore, almost eighty percent of individuals who seek treatment for regular heroin use indicated that they moved from legal

prescription opioids to the injectable, more potent form with significant risks and consequences (Oesterle et al., 2019). These individuals find themselves involved with the criminal justice system over time and treatment should be available for these individuals while incarcerated.

Despite the enormity of substance use disorder in the criminal justice system and its proven effectiveness in decreasing death by overdose in re-entry, most administrators have been reluctant to embrace it as a treatment modality. Opioid overdose is the leading cause of death among formerly incarcerated individuals (Winkelman et al., 2018). These offenders have a loss of tolerance to narcotics during incarceration which makes smaller doses of substances potentially fatal post-release. The criminal justice system represents a unique and valuable opportunity to facilitate the path to recovery; as well as prevent unnecessary and untimely death.

The National Institute of Health (NIH) recognizes the incredible importance of MAT and has partnered with the National Institute on Drug Abuse (NIDA) to providing financial and infrastructure support for the Justice Community Opioid Innovation Network (JCOIN) (NIH, 2019). JCOIN was created in an effort to support research and help agencies develop MAT programs in criminal justice settings across the United States (NIH, 2019). Research centers will study evidence-based medications, behavioral interventions and comprehensive patient-centered treatment modalities (NIH, 2019). In addition, there will be detailed research conducted on the effectiveness of new medications for SUD, methods to retain individuals in treatment and evaluating drug courts and other state mandates dealing with offenders with SUD (NIH, 2019).

## Successful Detoxification Protocols

In order to provide treatment for individuals suffering from SUD, the individual must first be successfully detoxed from the substances which they abuse. While there is a need to manage the symptoms associated with opioid withdrawal, there are typically no concerns regarding mortality and morbidity (Prater et al., 1999). Patients who are experiencing opioid withdrawal will receive supportive medications for nausea, diarrhea, and abdominal discomfort. In contrast, patients who are experiencing alcohol and/or benzodiazepine withdrawal must receive pharmacological interventions, close monitoring of symptoms and consistent assessment (Becker & Semrow, 2006). Depending on the duration and severity of the abuse, withdrawal symptoms may appear right away or weeks after incarceration. Even when initial withdrawal symptoms are not noted, it is prudent for correctional medical staff to assess the patient's neurological status, vital signs, and stability during the initial period of incarceration (Becker et al., 2006). For alcohol and benzodiazepine withdrawal, Librium is the drug of choice by doctors (Fernandez, 2011). Librium is a controlled substance and is successful for withdrawal because of its wide therapeutic window and long half-life, making it ideal as each dose tends to self-taper (Prater et al., 1999). It allows for flexible dosing, based on the clinicians' opinion and the patient's presentation of withdrawal symptoms and improvement (Fernandez, 2011). The relevance of detoxification to MAT programming is two-fold. First, a patient must successfully complete a detox protocol to ensure they are healthy and able to fully participate in treatment. Secondly, some correctional facilities consider the inclusion of Librium in their withdrawal protocol as a form of MAT which

requires education across the discipline. Effective withdrawal protocols should be a standard of care and should not be considered MAT (Linden et al., 2018).

## MAT as a Treatment Modality for SUD

Medication assisted treatment (MAT) is the use of medications, especially buprenorphine, naltrexone or methadone coupled with evidence-based therapeutic interventions and individualized counseling to treat substance use disorders. Ideally, MAT interventions include case management as well. MAT is considered the gold standard in psychopharmacological care of opioid use disorders and has proven efficiency in reducing injecting among users who inject drugs, particularly street-based injecting which comes with additional risk (Office of the Surgeon General, 2016). Treatment using MAT includes opioid agonist treatment (i.e., methadone; also referred to as opioid substitution therapy), combined with counseling and behavioral therapies to treat opioid use disorder (Office of the Surgeon General, 2016; US Dept of Health and Human Services, 2016). MAT provides important psychopharmacological benefits for individuals living with opioid use disorders and may also have benefits that transcend the immediate treatment environment. For instance, the general population of non-incarcerated individuals living with substance use disorders, Mittal et al. (2017) examined whether MAT had the added benefit of reducing the likelihood that individuals who inject drugs would expose or initiate others into injecting. They found preliminary results to suggest that enrollment in MAT may have the added effect of reducing initiation of injection to others (users were 38% less likely to have initiated others into injection) (Mittal et al., 2017). Additionally, the longer individuals received MAT the less

likely they were to ever provide injection imitation assistance to others (Mittal et al., 2017). Other studies suggest that adherence with Buprenorphine based medical assistance therapy may reduce high-cost service utilization such as impatient and emergency room services (Tkacz et al., 2014).

Treatment and recovery care for individuals who are addicted to opioids take a variety of forms and should be specialized in order to be successful. People suffering from substance use disorder are very different. Some may be suffering from co-occurring disorders and are at different levels of disability. Some may be facing significant socio-economic struggles like homelessness, unemployment, and lack of education or even literacy. Others may be high-functioning addicts who are able to remain gainfully employed, maintain relationships and status in the community. However, both groups are suffering from an addiction that controls their thoughts, behaviors and attitudes and significantly decreases their quality of life. For these reasons, a treatment program must treat a variety of symptoms and operate from a treatment modality that considers the whole person.

Notwithstanding the variations in individuals suffering from substance use disorder, there is substantial evidence available to understand the best practices, types of services, treatments and supports that reduce substance use, promote resiliency and recovery and allow for an improved quality of life (Kashef, 2018). Over 2.1 million people in the United States suffered from a substance use disorder in 2017, the same year this opioid epidemic was deemed a national public health emergency (SAMHSA, 2019). This public health emergency has impacted the criminal justice system, specifically

corrections dramatically. Approximately, 30 to 45% of offenders indicate they are unable to control their illegal drug use and admit to serious drug dependency (SAMSHA, 2019). Medication Assisted Treatment has been deemed an effective tool for treating offenders with substance use disorder yet there is an incredibly low percentage of offenders who are receiving these services while incarcerated (SAMSHA, 2019).

## Opioid Antagonist Versus Methadone and/or Suboxone

Maintenance services may include a variety of pharmacological interventions that specifically treat individuals with substance use disorders. Methadone and Suboxone are both widely prescribed in the community and pregnant females will receive Subutex while incarcerated to ensure that the baby will not experience the peaks and troughs of withdrawal and to prevent fetal demise (Mascola, 2017). From a correctional operational perspective, it is challenging to consider implementation of any medication that has diversion potential and could be used as contraband or a source of currency within the facility. The program highlighted in this dissertation is not using Methadone or Suboxone but Naltrexone instead. Naltrexone is a full antagonist medication that binds preferentially to the opioid receptors in the brain but does not provide the euphoric effect (feeling of being high) and therefore, has no diversion potential (Sullivan et al., 2017). Naltrexone can be administered in pill form or a long-acting injectable form, Vivitrol. Naltrexone is also beneficial as a treatment modality because if an individual is prescribed this treatment uses opioids, the medication blocks the euphoric and sedative effects of the substance (Sullivan et al., 2017). Substance use while in treatment is rendered useless. It is also widely seen as easier to administer because neither form of the

medication requires special licensure or certificate of administration as with Methadone and Suboxone (Sullivan et al., 2017).

Finally, the impact of using an opioid antagonist as a treatment modality has seen positive results with regards to recidivism (SAMSHA, 2019). “Four meta-analyses reported significant reductions in re-arrest or reincarceration rates for Naltrexone” (SAMSHA, 2019, p. 21).

## Naltrexone as an Effective Pharmacological Intervention

Naltrexone is a medication that has been identified as a valuable pharmacological intervention in the treatment of substance use disorders, specifically alcohol and opioid use disorders. Naltrexone can be used as part of a comprehensive treatment approach for opioid use disorder. It helps prevent relapse by blocking the euphoric and sedative effects of opioids. It works by binding to those receptors in the brain, effectively preventing opioids from attaching to those receptors and producing the ‘high’ effect. Naltrexone is also beginning to be utilized in the treatment of alcohol use disorder. It helps reduce cravings for alcohol and decreases the euphoric feelings experienced with the consumption of alcohol. By blocking the enjoyable effects of alcohol use, naltrexone can be beneficial in reducing the instances of alcohol abuse and promote moderate use or abstinence.

Naltrexone can be administered orally in pill form and taken daily as well as in an injection. The injection is an extended-release formula which is administered once per 28-day cycle and can be more effective in MAT program as medication compliance is more likely once every 28 days than daily. The efficacy of Naltrexone can vary based on

an individual's physiology, severity of the substance use disorder, prior treatment, mental and physical wellness and adherence to the treatment protocol. It is critical to any treatment for substance use disorder that an individual is not simply provided a pharmacological intervention and nothing else. Just as metformin or insulin is meant to treat diabetes, it is most effective when utilized in concert with proper nutrition, low calorie diet and exercise. Naltrexone, nor methadone or suboxone is intended to treat substance use disorder as one component of a comprehensive plan along with behavioral therapy, proper medical and mental healthcare and individualized addiction treatment.

## Natural Supplements and Improved Brain Health

In a study conducted in 2002, Gesch et al. found that micronutrient supplementation led to a significant decrease in prisoners' behavioral infractions, even in an environment that is not conducive for behavioral change (Gesch et al., 2002). There was a study conducted that provided a group of correctional patients with a supplement that contained 27 micronutrients, such as vitamins, minerals, and essential fatty acids, and the control group received a placebo. The study's participants did not differ in prior criminal history, institutional record or mental health issues (Gesch et al., 2002). The patients receiving the micronutrients committed 26.3% fewer behavioral infractions and a 37% reduction in serious incidents such as fights, suicide watch, etc. (Gesch et al., 2002). Nutritional supplements provide the individual with exactly what the body needs to carry out cognitive, emotional, sensing and response functions (Gesch et al., 2002).

Another consideration in addiction treatment and the brain involves Reward Deficiency Syndrome (RDS), a name originally given by Ken Blum in 1995 (Durazzo et

al., 2010). The reward system of the brain is located in the prefrontal cortex and this system can impact decision-making and engagement in risk-taking behaviors (Leyton, 2014). RDS is a brain disorder in which there is a deficiency of an essential neurotransmitter, dopamine (Leyton, 2014). Whether this deficiency is caused by a genetic predisposition, lack of consequences for risky behaviors during childhood development or other factors entirely, it impairs the growth and development of the brain (Durazzo et al., 2010). The use of illegal drugs generates a dopamine spike that cannot be recreated by natural, healthy means (Leyton, 2014). Therefore, once an addict seeks treatment and begins the recovery process, there is a necessity for macronutrients that repair the damage done to the brain through substance abuse. The MAT program being analyzed includes several macronutrients to aid in brain healing which serves as equally important as the opioid antagonist in successful recovery.

## Brain Health and Resiliency

Substance use disorder is considered to be a chronic, treatable illness that requires long-term, in-depth, individualized treatment. Treatment for substance use disorder is marked by periods of "remission" which can be defined by a reduction in or elimination of cravings. symptoms of withdrawal and relapse (Rudzinski et al., 2017). Considering the chronic nature and behavioral impacts of substance use disorder, the primary aim of treatment is recovery, rather than cure (Rudzinski et al., 2017). Recovery, also known as resiliency, is a process of change through which individuals improve their wellness and health, live self-directed lives and strive to reach their full potential (Rudzinski et al., 2017).

Substance use disorder impacts an individual's overall health to include liver and kidney function, cardiovascular system damage but significantly impacts their brain health. Substance abuse is closely linked to numerous cognitive deficits including impulsivity, memory, attention, processing speed and verbal cues (Powell et al., 2021). These skills are often referred to as executive functions which impact all aspects of an individual's cognitive ability, mood and treatment outcomes (Powell et al., 2021). Brain health can be measured with a cognitive assessment tool that tests sensory perceptions. It tests speed, focus, fatigue, accuracy, sequencing, timing perception, plasticity and connectivity-all of which retard when substance abuse is present. These skills can be improved with particular treatment modalities that incorporate natural supplements, cognitive behavioral therapy and medication assisted treatment (Sullivan et al., 2017). A holistic approach to substance abuse must include repairing of damage done and improvement of overall brain health to provide an individual with their best opportunity for recovery.

The correctional facility that served as the focus of this study includes brain mapping which is intended to measure an offenders' overall function and processing capacity. The program is also oriented to a holistic approach and pays attention to nutritional components and vitamin deficiencies that may exacerbate cravings. The inclusion of multiple modalities and a combination of programs is one unique attribute of this particular program. In the prison setting, most RSAT programs merge different modalities such as cognitive behavioral therapy and 12-step programs with MAT and other elements of treatment (Tuck & Stossel, 2019).

## Cognitive Behavioral Therapy

Cognitive Behavioral Therapy (CBT) is a form of mental health treatment which has been shown to be effective in addressing a wide range of problems including depression, anxiety disorders, substance abuse disorders, and some adjustment disorders. Numerous research studies suggest that CBT leads to significant improvement in functioning and quality of life for individuals successfully completing treatment (Magill et al., 2019). In many studies, CBT has been demonstrated to be as effective as, or more effective than, other forms of therapy or psychiatric medications (Magill et al., 2019). CBT is based on several core principles. First, psychological problems are based, in part, on faulty or unhelpful ways of thinking (Hoffman et al., 2012). Second, psychological problems are based, in part, on learned patterns of unhelpful behavior (Hoffman et al., 2012). Third, people suffering from psychological problems can learn better ways of coping with them, thereby relieving their symptoms and becoming more effective in their daily lives (Hoffman et al., 2012).

CBT treatment involves efforts to change thinking patterns. Patients learn to recognize the distortions in thinking that are creating problems and to reevaluate them in light of their current realities. They are also introduced to problem-solving skills which will help them cope with difficult situations without resorting to old, often destructive, or problematic behaviors (Magill et al., 2019). Patients learn to change the way they think about situations they have experienced in the past, situations they will encounter and that enables them to change the way they behave. The concepts taught enable a patient to

move forward in their lives with focus only on the productive, positive decisions and choices that will allow them to remain substance free and engage in prosocial behaviors.

CBT is widely recognized as an effective treatment approach for individuals suffering from all kinds of disorders from anxiety, over-eating, obsessive-compulsive disorder as well as substance use disorder (Wenzel et al., 2016). While there is no pharmacological intervention, the curriculum and treatment protocols focus on the connection between thoughts, feelings and behaviors and seeks to improve patterns of negative behaviors that contribute to substance abuse (Wenzel et al., 2016). Within the context of treating SUD in the criminal justice population, there are several key aspects that encourage a transition to prosocial behaviors from maladaptive coping skills. CBT begins by addressing the underlying causes of the substance use disorder targeting negative emotions, distorted thinking patterns and dysfunctional coping skills that often encourage addictive behaviors (Heimberg & Juster, 1995). The individuals participating in CBT are provided positive coping skills to manage negative and often high-risk circumstances, anticipate and effectively handle triggers and cravings and establish a plan to avoid using substances (Heimberg & Juster, 1995). Just as individuals without SUD have distinct ways of coping with stress, some clean, some nap, some engage in physical activity, there is a need for this element to be personally tailored to the individual. In this treatment program (WVRJ), individuals will build a toolbox with tangible items that will seek to meet their needs when confronted with triggers that typically lead them to use. Some participants include photographs of their children or loved ones who are counting

on them. Some participants include a journal, favorite snacks or puzzles - things that can appropriately occupy their mind and require redirection.

Cognitive behavioral therapy increases self-awareness by equipping individuals to identify the thoughts, feelings and behaviors that are associated with their substance use. Through techniques such as mindfulness and cognitive restructuring, individuals will learn to develop better impulse control and make healthier choices (Wenzel et al., 2016). CBT, especially when delivered in a therapeutic community, provides a supportive environment where individuals can discuss their struggles, receive feedback and guidance and work collaboratively with like individuals who have struggled with SUD (Wenzel et al., 2016). These therapeutic communities can be integral in motivating individuals, building accountability, and encouraging one another through prosocial activities (Wenzel, et al., 2016).

## Impact of COVID-19

The 2020 COVID-19 pandemic affected various aspects of life, from social interaction to contributing to housing and employment instability as well as causing challenges to access to treatment (mental and medical). Multiple studies suggest that COVID-19 and the accompanying restrictions have had a significant impact on opioid abuse and overdose rates. Compared to a 12-month period in 2019, 2020 saw a 38% increase in opioid overdose deaths (Kuehn, 2021). In another study, a single Virginia emergency department saw non-fatal overdoses more than double (Ochalek et al., 2020). While COVID-19 affected the whole of society, vulnerable populations such as those with a history of substance abuse can be more at risk for adverse health conditions. Social

distancing guidelines have disrupted responses to overdoses as well as significantly limiting the treatment options and availability of outpatient services for current addicts (Imtiaz, 2021). Offenders being released from incarceration are at a high risk of overdose based on the fact that their tolerance has diminished while locked up and the amount they were using at the time of arrest may be lethal upon release (Wakeman et al., 2020).

## Summary

This literature review was intended to provide a detailed background to the challenges associated with the opioid epidemic and treating those with addiction. Addiction is often misunderstood by individuals who have not been personally impacted by the disease, so it was important to describe the addiction cycle. It is also important to view corrections from a historical perspective as well as in the current sequential intercept model. Further, it is important to evaluate the literature regarding treatment of SUD to ensure the most effective approach to reaching successful outcomes with the correctional population while integrating evidence-based practices. In the next chapter, there will be information provided with more of a focus on the research study, methodology and data discussions and other considerations for quantitative research.

# Chapter 3: Research Method

The opioid crisis in the United States is pervasive and has increased over the last 2 decades. According to SAMHSA (2020), data from 2019 indicated that an estimated 10.1 million people aged 12 or older misused opioids in the past year. Most of these cases were misuse of prescription pain relievers (9.7 million people) and heroin use (745,000 people; SAMSHA, 2020). Among the prison population, 85% have an active substance use disorder or were incarcerated for a crime involving drugs or drug use (SAMSHA, 2020). Inmates with opioid use disorder are at a greater risk for overdose following release from incarceration (NIDA, 2020). Therefore, it is important that solutions to the problem of substance use disorders for the incarcerated include the most effective evidence-based treatments to address the problem. Those treatments are a behavioral health approach and MAT.

The current research participants were offenders with diagnosed substance use disorders who had been enrolled in the MAT program in their correctional facility. Housing while incarcerated is specialized in that it is a therapeutic community with privileges and activities allowed that are not permitted with the general population of offenders. The therapeutic community model emphasizes the development of prosocial attitudes, interpersonal skills, and accountability (De Leon & Unterrainer, 2020). The therapeutic community model incorporates elements of substance abuse treatment including pharmacological interventions, accountability, and development of healthy interpersonal skills and prosocial attitudes (De Leon & Unterrainer, 2020). The goal is to address the underlying causes of criminal behavior, facilitate positive personal change,

and prepare the offenders to sustain recovery and prosocial thoughts and behaviors when released into the community.

## Research Design

In social science research, the goal is not to prove anything but instead to measure probability. Research is a systematic process of collecting, organizing, and analyzing data to increase the understanding of the phenomenon (Bachman & Schutt, 2001). A researcher will find support for and against a particular research problem, question, or hypothesis (Bachman & Schutt, 2001). In a quantitative study, the variables can be reduced to numeric values for analysis. In the current study, test scores were the data being analyzed. Test scores were recorded from a pre, and posttreatment evaluation tool called the Hamilton Anxiety Rating Scale (HAM-A) and Depression (HAM-D). A clinician administered these tests by conducting structured interviews with the individual, one prior to MAT treatment and one after successful completion of the program. The clinician rated each item based on the individual's responses along with observable behaviors and overall demeanor. The total score was calculated by adding the scores of each item and providing an overall measure of anxiety or depression.

HAM-A and HAM-D testing instruments are widely used in clinical diagnosis, treatment practices, and research for assessing the severity of anxiety and depression symptoms in patients and was developed by a psychiatrist. The instruments are designed to aid clinicians in diagnosing, evaluating, and tracking progress in these disorders. The HAM-A consists of 14 items that assess various indicators commonly associated with anxiety, including physical, psychological, and autonomic symptoms. Each item is rated

on a numeric scale from 0 to 4, with higher scores indicating greater severity of symptoms associated with anxiety disorders. The items cover areas such as tension, fear, difficulty concentrating, insomnia, and cardiovascular symptoms. There are three primary uses for the HAM-A: research tool, clinical assessment, and diagnosis screening. HAM-A is used in clinical trials and studies to assess the efficacy of new treatment methodologies, interventions, and therapies for anxiety disorders. The HAM-A provides a standardized measure that allows for objective comparisons among patients. Second, health care professionals can administer the HAM-A to evaluate the severity of a patient's symptoms. By assessing individuals using this tool, health care professionals can determine the level of a patient's anxiety and what changes occur over time. Ideally, there would be a marked lowering of total score as a patient makes progress in their treatment. Finally, the HAM-A can be used as part of a comprehensive assessment to aid in the diagnosis of anxiety disorders. The objective scores allow a health care provider to determine whether an individual is experiencing normal levels of anxiety based on stressors or whether the level is clinically significant, thereby requiring more regimented treatment.

The HAM-D is the screening tool for depression. The HAM-D consists of 17–21 items that evaluate symptoms of depression, such as guilt, insomnia, anxiety, agitation, and mood. As with the HAM-A, the scores range from 0 to 4 with the higher score indicating more significant depression symptoms. The HAM-D is commonly used in research settings similar to the HAM-A, as well as by health care professionals to diagnose, treat, and measure symptom severity and improvement over time.

I used a quantitative approach because all participants had been exposed to the components of the MAT program while incarcerated. Secondary analysis was conducted on data that had been submitted to the VDCJS by the jail. The reporting completed by the correctional facility included documentation that proved the facility was meeting the objectives of the MAT program. However, the pertinent documentation used for the current study included participant scores on validated tests as well as cortical metric results and what changes occurred from the beginning to the successful completion of the program.

Secondary analysis as a research methodology is a further analysis of data and research findings and is valuable because it presents interpretations and conclusions different than what had been originally reported (Cheng & Phillips, 2014). I reviewed the submitted data provided by the facility to VDCJS and conducted analysis of the submitted data to determine whether there was a correlation between the program components and participants' overall physical and emotional health and resiliency at the conclusion of the treatment. A memorandum of understanding and collaboration agreement was signed with the superintendent of the correctional facility to ensure there would be no issues regarding access. The quarterly data collected, and outcome measures submitted to VDCJS were provided to me upon approval from the Walden University Institutional Review Board. The quarterly reports were gathered, reviewed, and analyzed to answer the research questions.

Data collection took place from January 2022 to December 2022 in four intervals when the quarterly reports were submitted to the VDCJS. A quarter, as defined by the

grant instructions, is every 3 months with the reporting of the outcome measures required by the 10th of the subsequent month. Therefore, data were collected from April 2022 through January 2023 with secondary analysis being done on data collected from January to December. The rationale for this particular time frame was to make a definitive beginning point and end point for data collection. A spreadsheet was created to record the descriptive statistics, including gender and age, and to record the pre- and posttest scores for the cortical metric scans as well as the HAM-A and HAM-D evaluations.

TCU Criminal Thinking Scales are administered to individuals as a treatment program begins. Based on the original scores, mental health providers will facilitate group sessions focused on different thought patterns and beliefs that appear to contribute the most to delinquent, criminal behavior (Sease et al., 2022). Cognitive behavioral therapy is utilized most often in this setting and effectively identifies negative thoughts, examines those arguments supporting or refuting those criminal thoughts and teaches an individual more positive, prosocial thoughts (Sease et al., 2022). Those individuals who are administered the CTS and participate in the MAT program will have the pre- and post-test scores recorded to determine what changes can be measured.

**Secondary Data Analysis**

Maxfield and Babbie define secondary analysis of research previously collected for a separate and distinct purpose (2018). Secondary analysis has become an essential research method and has now emerged as the manner in which to study concepts within social science (Kiecolt & Nathan, 1985). For good reason, universities and institutional review boards are restrictive regarding vulnerable populations and with the collection of

statistics and data required by numerous regulatory and state agencies, secondary analysis seems far less intrusive but equally efficient as a methodology (Sullivan & Maxfield, 2003). Utilizing secondary data analysis is an effective manner in which to evaluate offender's lifestyles and behavior. Literature reviews follow Cohen and Felson's (1979, p. 605) suggestion that routine activity concepts can be applied to decision-making by those individuals who are involved in the criminal justice system (Maxfield, 1987).

In regard to research methodology specific to social science research, it is important to review literature and textbooks from Maxfield and Babbie. These social scientists guide students through different methodologies that can be beneficial when examining such things as criminogenic risk factors, criminal justice policy and subsequent successes and failures. In their text, *Research Methods for Criminal Justice and Criminology,* Maxfield and Babbie evaluate data collection methods such as survey and field research, content analysis and secondary data analysis (2018). While there are a variety of effective methods for criminal justice research, researchers must be cognizant that they are typically working with vulnerable populations and secondary analysis provides an effective manner in which to investigate without ethical concerns. Further, secondary analysis is noted as an effective methodology producing high results in essential research categories such as sampling, validity, and reliability (Sullivan & Maxfield, 2003).

The process of secondary analysis varies slightly depending on the sources of information and subject being studied but there are a series of steps that are followed (Warner, 2020). Initially, researchers need to identify relevant datasets that align with

their research interests. These datasets can come from surveys, censuses administrative records, or public archives (Warner, 2020). Depending on the data source, a researcher may have access to a public domain, require permissions or agreements. A researcher must then become familiar with the information in order to understand the structure, content and limitations of the dataset they intend to analyze (Warner, 2020). The researcher must thoroughly examine the data to understand the variables, data collection methods and any potential biases inherent in the data. The next step in the secondary analysis process is for the researcher to develop a research question or questions or formulate a hypothesis and null hypothesis focused on the data to be reviewed (Warner, 2020). The research question or hypothesis can focus solely on the data presented, expand on prior research or examine completely new concepts. Before the secondary analysis can take place, a researcher will need to 'mine' the data (Johnston, 2014). In other words, there may be additional information that would be superfluous, errors in the data set, missing information, etc. These issues will need to be addressed along with whether the current presentation of information is reported in a fashion that would translate appropriately into the research question or hypothesis of the current study. A researcher may need to recode the variables, combine data sets, or create a completely new table (Warner, 2020).

Once those steps are completed, a researcher will have to perform the appropriate secondary analysis, whether quantitative, qualitative, or mixed. The secondary analysis will be performed on the mined, current version of the data and then the findings would be evaluated and examined within the context of the new research question and

hypothesis (Johnston, 2014). A thorough presentation of these findings will include an assessment of the reliability, internal and external validity and limitations of the research study as well as identify any themes or patterns detected.

While cost-effective and time efficient, secondary analysis has several limitations. Researchers conducting secondary analysis have limited control of the data collection process and the variables examined (Johnston, 2014). This type of research does not allow a researcher to generate any data as they are required to work with existing data sets. When considering integrity in research, a researcher conducting secondary analysis cannot guarantee the quality of the original data collection, methodology or reliability (Warner, 2020). This limitation can be addressed during a secondary analysis by critically evaluating the primary study and looking for flaws that can contribute to lack of reliability or validity. Secondary analysis as a methodology can also be less thorough if the researcher is not provided with ample context or details regarding the original study.

The methodology for this study was secondary analysis and sought to ensure validity and reliability as there is little question about the fundamental statistics being evaluated. There was simply an interpretation of raw data that was being collected with no bias. Research is based on the idea that quality studies will address epistemology, which is the study of the nature of knowledge (Spatz, 2016). As a researcher focused on the criminal justice system, it is evident from the literature that the current approaches to substance abuse treatment in the past few decades have been ineffective. Therefore, it is critical to look at how we learn, how we acquire knowledge and how we apply logic and reason to new processes and research (Spatz, 2016). Secondary analysis and more

specifically, the analysis of statistical data is fundamentally mathematical and based on reason (Spatz, 2016). Critics of quantitative data will argue that statistics can be manipulated and misused but there is no argument that statistical methodology such as secondary analysis is unreliable (Spatz, 2016). For these reasons, secondary analysis served as an appropriate and relevant methodology for this study.

A three-step process was followed to analyze the data that is being submitted to the Virginia Department of Criminal Justice Services. The initial step was exploratory and essentially a review of the data. It involved reviewing all of the data and reading through the reports that have been submitted. There are descriptive statistics that can be utilized during this initial step in an attempt to develop preliminary ideas regarding the results (Spatz, 2016). Using means, percentages, etc. between the initial testing and testing conducting after the program is completed and identifying the differences will be essential in addressing the research questions. Secondly, it was critical to determine if these differences can be attributed to chance or something other than the variables proposed. Using inferential statistics or significance tests to address the null hypothesis was completed as the second step (Spatz, 2016). The third and final step was to synthesize, report and illustrate those conclusions drawn from the secondary analysis and ensure it can be used to inform future policy and decisions.

**Data Analysis Plan**

While this review occurred during a specified period of time, reports from the facility to the Virginia Department of Criminal Justice Services are continually submitted each quarter- April, July, October and January respectively. Included in these quarterly

reports are required components that are stipulated by the federal and state governing agencies. Items such as financial reporting, number of participants in programming separated by gender and age as well as statistics on successful completions, releases from custody, etc. are included in the quarterly reports. However, the statistical data that was the focus of this research study were the scores of several evidence-based testing instruments and those results. Several testing instruments, the TCU Criminal Thinking Scale, HAM-A & HAM-D and brain gauge are administered at two separate intervals in the process-once at the beginning and again after successful completion. Depending on the progress the participants make utilizing the components of the program, the validation tests (TCU Criminal Thinking Scale and HAM-A/D) and cortical metric scores should change over time. It would be the expectation that if the participants were benefitting from the holistic program components, the scores for the HAM-A and HAM-D would decrease from pre-test to post-test. The TCU Criminal Thinking Scale and the individual cortical metric section scores would increase if the participants were to benefit. The secondary analysis took place by reviewing these quarterly reports. Secondary data being the quantitative, statistical data that is submitted by the correctional program staff to the Department of Criminal Justice Services.

The Hamilton Rating Scale for Anxiety (HAM-A) measures anxiety in patients before and after treatment. The scale is administered by a healthcare professional and contains 14 items and is measured using a 0-point or 4-point scale (Hamilton, 1960). The items are defined by a series of symptoms and measures both psychological anxiety (mental agitation and distress) and somatic anxiety (physical complaints related to

anxiety) (Borkovec & Costello, 1993). The Hamilton Rating Scale for Depression (HAM-D) measures depression in patients before and after treatment. The scale is measured by the individual's response and subsequent score (3-point or 5-point scales) on the following criteria: depressed mood, feelings of guilt, suicidal ideations, insomnia, work and interests, retardation, agitation, psychic and somatic anxiety, gastrointestinal symptoms, hypochondriasis, weight loss and insight (Bech, et al., 2014). A secondary analysis of these scores will reveal whether these symptoms improve over time, remain the same or deteriorate.

HAM-A and HAM-D testing instruments are widely used tools in clinical diagnosis, treatment practices and research for assessing the severity of anxiety and depression symptoms in patients and was developed by a psychiatrist (Hamilton, 1969). It is designed to aid clinicians in the diagnosis, evaluation, and track progress in these disorders. The HAM-A consists of 14 items that assess various indicators commonly associated with anxiety including physical, psychological and autonomic symptoms (Belzer, 2006). Each item is rated on a numeric scale from 0 to 4, with higher scores indicating greater severity of symptoms associated with anxiety disorders (Matza et al., 2010). The items cover areas such as tension, fears, difficulty concentrating, insomnia and cardiovascular symptoms (Belzer, 2006). There are three primary uses for the HAM-A to include: research tool, clinical assessment, and diagnosis screening. The HAM-A is used in clinical trials and studies to assess the efficacy of new treatment methodologies, interventions and therapies for anxiety disorders (Bagby et al., 2004). It provides a standardized measure that allows for objective comparisons among patients. Secondly,

healthcare professionals can administer the HAM-A to evaluate the severity of a patient's symptoms (Belzer, 2006). By assessing individuals utilizing this tool, they can determine the level of a patient's anxiety and what changes occur over time. Ideally, there would be a marked lowering of total score as a patient makes progress in their treatment. Finally, the HAM-A can be used as part of a comprehensive assessment to aid in the diagnosis of anxiety disorders (Bech et al., 1984). The objective scores allow a healthcare provider to determine if an individual is experiencing normal levels of anxiety based on stressors or whether it is clinically significant thus requiring more regimented treatment.

The HAM-D is the screening tool for depression and comparative to the HAM-A. The HAM-D consists of a series of 17 to 21 items that evaluate symptoms of depression such as feelings of guilt, insomnia, anxiety, agitation and mood (Moller, 2001). As with the HAM-A, the scores range from 0 to 4 which the higher score indicates more significant depression symptoms. The HAM-D is commonly utilized in research settings similar to the HAM-A as well as by healthcare professionals to diagnose, treat and measure symptom severity and improvement over time (Moller, 2001).

The Texas Christian University (TCU) Criminal Thinking Scale is a pre- and post-assessment tool that is administered before and after the MAT program. The scale was developed to measure criminal thinking patterns as well as gauge the severity of these risks in several areas. These areas are entitlement, justification, power orientation, cold heartedness, criminal rationalization, and personal irresponsibility (Knight et al., 2006). The use of this tool is two-fold. Initially, it's important for a treatment provider to identify the severity of a patient's criminal risk and associated problems and see if a

particular program or curriculum effectively decreases the severity over time (Knight et al., 2006). Additionally, the severity of drug addiction and criminal behavior has been proven to be a predictor of the highest need for long-term positive outcomes (Simpson et al., 2002). In other words, the more severe the criminogenic risk factors and criminal thinking, the greater the need for treatment and rehabilitative services.

There is also a cortical metric screening tool, referred to as the Brain Gauge MD, which is listed as a medical device with the Food and Drug Administration and is compliant with 21 CFR 882.1470 (Computerized Cognitive Assessment Aid). It is a cognitive assessment tool that measures brain health by testing sensory perceptions in your fingertips (Tommerdahl et al., 2019). This testing instrument is administered to each participant as they enter the MAT program. The testing involves patented vibrotactile stimulation which provides understanding into cognitive function (Tommerdahl et al., 2019). Specifically, the test measures eight components of brain health: speed, focus, fatigue, accuracy, sequencing, timing perception, plasticity, and connectivity (Favorov et al., 2017). The comprehensive scores will be provided in the quarterly reports and there will be a secondary analysis completed to determine what, if any, change over time occurs in each participant's overall brain function and health.

A brain gauge can provide various types of information, depending on its design and purpose and level of sophistication and technology (Powell et al., 2021). Common applications include neurofeedback, brain-computer interaction, cognitive assessment, and neuroscience research. Brain gauges can enable individuals to receive real-time feedback about an individual's brain activity. This information can be used to train and

modulate brain patterns, helping individuals improve their focus, relaxation, or other cognitive abilities (Powell et al., 2021). There are brain gauges that can allow an individual to control separate, external devices, such as prosthetic limbs using their brain signals (BrainGauge MD, 2023). This technology can be incredibly useful for patients with motor function impairments and allow them more independence and abilities for daily functioning. Brain gauges can be used to measure cognitive performance and evaluate attention, memory, and other cognitive functions (Nguyen et al., 2013). By analyzing brain activity, they can provide insight into cognitive states, mental workload, or attention (Nguyen et al., 2013). Brain gauges are also increasingly utilized in neuroscience research to study cognition, mental disorders, and overall brain function. They can provide valuable data for clinicians to evaluate and draw conclusions about mapping neural activity and brain related phenomena, like the impact of substance use disorder on the opioid receptors in the brain.

**Instrumentation**

Every offender committed to this correctional facility is administered a Correctional Jail Mental Health Screening (CJMHS) that is gender specific. While this tool is completed by the offender and a registered nurse, it was beneficial to this researcher since it will provide a baseline score for the offender population which will serve as a comparison to the smaller subsection of offenders regarding the mental health and substance abuse needs of incarcerated persons. For those participants in MAT who are being enrolled in aftercare services, a second Correctional Jail Mental Health Screen will be administered upon their intake to a treatment provider in the community. That

score was recorded and compared with the initial screen to determine what, if any differences exist post-incarceration. A biopsychosocial evaluation is completed on each offender who enrolls in the therapeutic community and while there is not a numeric score attached to this open-ended interview used to design the treatment plan, data was collected to identify similarities and differences among individuals who participate and successfully complete MAT. Third, there is a Daily Living Activity checklist that is completed throughout the substance abuse treatment program. Those progressive scores are collected and become part of their individual medical records. Finally, these participants have weekly sessions with a psychiatrist focusing on cognitive behavior therapy, and transcripts of those sessions will be coded and analyzed along with regular visits with the supervising physician.

## Summary of Previous Research

Fazel et al. have completed a systemic review and regression analysis research confirming the prevalence of substance use disorders among those incarcerated and offering some intervention strategies (2017). Along with their findings, the authors make the argument that they need to prioritize health-oriented interventions and highlight that the correctional system is the most appropriate setting to begin a treatment regimen (Fazel et al., 2017). There has been an increase in the availability of opioid maintenance programs and expansion of potential treatment modalities (Society for the Study of Addition, 2017). These programs prioritize minimizing detoxification symptoms which is effective in decreasing overdose deaths but does not consider components such as cognitive-behavioral therapy and therapeutic community-based treatment which have

shown impactful in the reduction of recidivism and decrease of opioid abuse (Society for the Study of Addiction, 2017). Despite the meaningful expansion of opioid maintenance programs, there is still a need to educate correctional administrators to view substance abuse from a disease model perspective and not the lens of deviant, immoral behavior (Fazel et al., 2017).

## Evidence of Trustworthiness

Research (statistics specifically) is at times given a negative connotation based on the manner in which it is conducted, who is funding the project (if applicable) and the interpretation of the findings. While academic research should be immune to concerns such as bias, influence and reliability, it is critical for a project to be properly vetted prior to lending any value to the study and findings. It is important as a consumer of information in any field of study for an individual to consider the source and evidence supporting a claim. As a researcher, there are criteria that must be adhered to such as credibility, confirmability, dependability and transferability (Lincoln & Guba, 1985).

Credibility, in this context, can be addressed by whether the participants would agree that the findings and subsequent interpretations of those findings are depicted accurately (Lincoln & Guba, 1985). There are several tests that can be run through SPSS to address the reasonableness of the findings, but it would also be helpful to share the findings with the MAT participants or those clinicians involved in the programming and solicit their feedback. Confirmability can be defined as the ability of a researcher to authenticate the data, results and interpretations (Lincoln & Guba, 1985). This researcher will address the confirmability by maintaining records that contain the raw scores from

the validated testing instruments, thorough documentation of the secondary analysis process and evaluation as well as reflexive journaling as discussed in several research methods documents from Walden University. Dependability as it relates to trustworthiness will be contingent on factors within the study that occurred during the research project that could potentially impact the results (Lincoln & Guba, 1985). The COVID pandemic impacted a portion of this research study as it precluded the administration of the TCU Criminal Thinking Scale as originally planned for reasons that will be discussed in the next chapter. The audit trail explained as a measure to address confirmability can also be utilized in the instance of dependability (Lincoln & Guba, 1985). Transferability is critical as it addresses the ability of another entity to perform similar research and compare applicability of findings (Lincoln & Guba, 1985). In this particular research, transferability is something that is of significant importance because the desire would be that other agencies could implement the MAT program and its specific components and would have positive results that will serve as a promotion of the treatment modality at any correctional facility.

Research ethics, trustworthiness and credibility are usually assumed to be reasonably simple concepts and can be summarized with the ideology of 'do no harm.' When conducting research with individuals, it is critical that every effort be made to ensure that the subjects are not harmed or impacted negatively. Fortunately, Walden University has an institutional review board that will ensure that the research will follow very specific guidelines and objectively review the study to guarantee there is no opportunity for harm, inappropriate methodology or potential negative impact to the

participants (Ravitch & Carl, 2016). The institutional review board approved the proposal for this study in July 2022 and assigned it the following confirmation number: 07-07-22-0751905.

By utilizing secondary analysis as the methodology for this study, it was easier to ensure the absence of researcher bias. The data was gathered from a state agency and then entered into a separate spreadsheet which was then utilized to run the paired sample t-tests. To ensure internal validity, the results were reviewed separately by a statistician and a university research methodologist with no knowledge of the subject matter or research project. This additional step allowed for confirmation that the findings (changes in post-test scores) were due to the program components and not external factors (Shadish et al., 2002).

The reliability of the findings was evaluated using the same process. Analysis and testing were conducted in SPSS and then those results were reviewed by subject matter experts in quantitative methodology. Since reliability refers to the consistency of research findings, the results were evaluated to confirm that the changes in pre- and post-test scores were consistently and accurately measured across the participants and that the degree of change was reasonable (Shadish et al., 2002). While it cost time and financial resources to have these additional reviews completed, it added value to the findings and ensured objectivity of the researcher. A researcher seeks to be objective throughout the process by following established procedures and methods, but the transparency involved in handing off the results and summary of those findings to a second and third party with no knowledge of the study confirms that it was achieved (Shadish et al., 2002).

In social science research, especially when dealing with correctional institutions, the subjects being studied are vulnerable populations, and ethical considerations are heightened as a result. Consideration of research ethics is essential to determining the design, sample, and methodology for study of criminal behavior, thinking and the offender population (Vogt et al., 2012). This research focused on the impact of specific components of medication assisted treatment on offenders with substance use disorders. Qualitative interviews, evaluation and treatment notes, and evidence-based screening tools are collected, coded, and utilized to determine the significance of the treatment program to drive future policy and programming. As this study will consist of secondary analysis of quantitative data only, there were no anticipated concerns regarding researcher interference, bias or trustworthiness despite the subjects being considered a vulnerable population.

## Role of the Researcher

A preliminary request was submitted to the Superintendent of the facility that houses this program and permission was granted for access to these quarterly reports. There is a memorandum communicating the expectations of the researcher and the facility administration as well as collaboration agreement that details the methodology and identifies Walden University as the educational institution supervising the research study. The relevant data needed to answer the research questions is already being collected for grant funded project through the VDCJS. There is a means to eliminate all personal identifiers and simply provide raw data. The participants have already signed releases consenting to access to their medical records for the purposes of evaluating the

effectiveness of the program components for the grant documentation. These records are submitted quarterly as justification of grant funded programming through a state agency and therefore, could be easily obtained under the Freedom of Information Act. It is essential to document the process, incorporate a peer review process, and routinely evaluate the process to ensure fidelity (Laureate Education, 2010).

In order to conduct a secondary analysis of the relevant data, this researcher obtained the quarterly reports available online and recorded the statistics relevant to this project. Quarterly reports with data from January 2022 through December 2022 were gathered and the scores from the HAM-A and HAM-D testing as well as the cortical metric brain scans were entered into the Statistical Package for Social Scientists (SPSS) by IBM. Descriptive statistics including gender and age were collected and were included in the data results. The HAM-A and HAM-D scores were compared in a pre- and post-test format using a paired-sample t test. In addition, a paired-sample t test was performed on each of the six measurements and one overall score which is included in the testing results. The sample size for these particular tests were small based on the length of the treatment program, which lasts between ninety to one hundred twenty days and that is if there are no issues with the treatment programming whether that be behavioral or compliance, medical or mental health concerns that require a fundamental adjustment to treatment protocols. While that is frustrating from a researcher perspective, it can be disheartening for those individuals in treatment. As weight loss coaches counsel obese patients that weight loss will be a ‘journey’, the same applies to substance abuse recovery. Individuals don’t get obese overnight or even over several months. Individuals

do not become criminal justice involved because of their substance use disorder after a few weeks or months of being addicted.

## Ethical Procedures

The research study followed the ethical guidelines set forth by Walden University's IRB for research involving human subjects. As a vulnerable population, offenders must be afforded certain protections such as informed consent, confidentiality, and protection of PHI. These concerns were addressed throughout the data collection and analysis.

It is important to note that the data utilized for the secondary analysis contained no personal identifiers such as name, offender identification number or housing location. There was a separate identification number assigned to each participant by the facility which was autogenerated by the software used with the brain gauge. It was the only manner in which the participant's pre- and post-test scores could be connected (with no PII). The same method was utilized with the HAM-A and HAM-D screening tools for continuity of scores but no other identifiers were submitted to the VDCJS. This cleansing of the data was important to protect the privacy and confidentiality of the participants but also to ensure that the highest ethical standards for research. In addition, there is a stigma that exists surrounding such things as incarceration, addiction, mental health and substance abuse treatment and individuals will often report feelings of shame or fear of other's reaction (Lai et al., 2021). It is critical that there be the utmost consideration for an individual's personal safety, privacy and their information to be handled with sensitivity and following all safeguards possible. Based on the manner in which this data

was collected for secondary analysis, maintaining the participant's anonymity and shielding them from potential harm was accomplished with ease.

## Summary

The methodology chapter is intended to outline what outcome measures were collected by the facility and what the secondary analysis would evaluate and analyze. The purpose of this research was to determine whether there is a meaningful relationship with the individual offender and overall health which is essential to remaining drug-free and out of the jail system. Data collection was limited to 2022 but provided some insight into the success of the program in overall brain health and mental well-being.

This chapter provided a thorough explanation of the research methodology and the relevant testing instruments utilized as a part of this program. The next chapter will detail the results of the secondary analysis, statistical analysis completed utilizing the Statistical Package for the Social Sciences and interpretations where applicable. There will also be an explanation of what these findings mean to future MAT programming in Virginia.

# Chapter 4: Results

Opioid abuse has been identified as a public health crisis facing the criminal justice system, and correctional facilities are an untapped resource for substance abuse treatment, specifically MAT programs (Neale et al., 2018). Although methadone and suboxone have been introduced in a variety of MAT programs both in- and outpatient settings, there was little research on using an opioid antagonist with no diversion potential or addictive properties. Furthermore, there was a gap in the literature regarding supplemental medications, cognitive behavior therapy, and comprehensive treatment. The following research questions were addressed in this study: What perceived difference does a comprehensive medication assisted treatment program that treats the whole person (physically and psychologically) have on an individual who is suffering from addiction and seeking long-term, sustained recovery? What changes can be observed and recorded after the program components have been successfully completed by the participants? Can those changes be considered positive outcomes and are they associated with sustained recovery? What do participants experience with this holistic approach that is significant or has been lacking in previous substance abuse treatment?

The facility, Western Virginia Regional Jail, where this research was conducted provides residential treatment for individuals incarcerated with substance use disorders in Southwest Virginia. The correctional system in Virginia is a combination of local county or city jails and small regional jails that operate on shared agreements between local governments working collectively (McDonnell, 2018). The RSAT program began at WVRJ in 2014 and is offered to both men and women who are incarcerated and have a

substance use disorder (Russell, 2020). The program serves Franklin, Montgomery, and Roanoke counties and Salem, Virginia by providing services for a significant portion of the region. RSAT is operated as a full therapeutic community. The WVRJ uses small groups of 18–24 participants, and offenders with successful experience in the program function as coordinators with staff implementing the structure of the programs and guidance on how contracts are administered. Their program adheres to a 12-step approach, an element that should provide participants with familiarity as they transition to community-based 12-step programs upon release.

The approach at this facility is unique in that they encourage the use of buprenorphine, Vivitrol, and methadone to decrease and manage withdrawal among the offender population. The literature confirmed that the primary determinant of success is the duration for maintenance with one of these medications (Chow et al., 2021). The pharmaceutical industry pays for these studies, so it stands to reason that the focus is on medication maintenance and continued revenue. The primary difference with the program that was the focus of the current study is that there is consideration of the painful process of detoxification, the desire of offenders who want to remain opioid free, and the exit ramp for these individuals.

The program at WVRJ focuses on three areas: the brain, behavior, and the beliefs. Focus on the brain goes beyond determination of a genetic predisposition to drug abuse or addiction. Clinical consideration is given to assessing and addressing micronutrient deficiencies with the knowledge that correcting these deficiencies will restore a healthy dopamine norepinephrine balance (Murphy et al., 2020). The daily habits expected in the

therapeutic community attempt to address previous traumas that led to an addictive lifestyle while establishing daily practices needed for a successful life. Changing behavior happens in response to these prosocial daily activities learned through the evidence-based curriculum. Everyone has a worldview that determines their goals and direction in life. Throughout this program, participants are encouraged to examine that worldview and clarify healthy goals for their life.

This correctional facility houses the MAT program in two separate units (one for males and one for females) to ensure that they can maintain a therapeutic community that is most amenable for treatment. Therapeutic communities are valuable in that they bring together offenders with similar problems, challenges, and goals; the sense of community from peers can be powerful in fostering personal growth and reducing feelings of shame and isolation (D. R. Schaefer et al., 2021). Participants who engage in treatment in a therapeutic community also benefit from the programming and service provisions that are essential to skill development. Offenders can learn new skills and abilities through the vocational and educational programs that are provided as well as increased self-awareness (D. R. Schaefer et al., 2021). All of these key aspects work collaboratively to address the root causes of criminal thinking and behaviors and provide participants with valuable tools to reenter their community and engage in prosocial, law-abiding behaviors (Richardson & Zini, 2021). In Chapter 4, I present the results of the statistical testing completed using SPSS and interpretations of the results. Further, I address the findings within the context of substance abuse treatment and the future of correctional MAT programs.

## Data Collection

The data for this research project was collected from program participants who were enrolled from January 2022 through December 2022. The correctional facility reports to the VDCJS every 4 months (four quarters per year) by the 10th business day of the following month (Hayes, 2022). Therefore, secondary analysis was conducted on information submitted to VDCJS from April 2022 through February 2023. The participants were housed in a therapeutic community where offenders were encouraged to actively participate in their personal recovery journey. The community operates on principles of mutual support and accountability as well as self-awareness and personal responsibility (De Leon & Unterrainer, 2020). Offenders are required to actively participate in group therapy sessions, educational and vocational programs, individual counseling, skill-building activities, and other therapeutic activities deemed beneficial by the facilitators of the program (De Leon & Unterrainer, 2020). For this reason, facilitators consider a maximum operating capacity to be 20 or fewer participants at one time (Malivert et al., 2012).

WVRJ houses two separate therapeutic communities, one for female offenders and one for male offenders (Hayes, 2022). The programs operate on rolling admission, which means that there are individuals who have been evaluated, interviewed for willingness to participate, and deemed appropriate for the therapeutic community and MAT, and who remain on a waiting list until a bed is available. Offenders are admitted to the therapeutic community, and their individual treatment program begins; the program lasts up to 120 days (De Leon & Unterrainer, 2020). Other offenders who are provided as

mentors and buddies aid the newly admitted participant in the program activities, schedule, etc. (Malivert et al., 2012). A typical program consists of offenders at all stages of the program (similar to a high school or college sports team), which can be beneficial because participants are able to seek guidance from peers who have experienced what they are going through.

Both of these housing units administer an identical MAT program with the pharmacological interventions, psychiatric care and supplemental medications provided as appropriate. The data collected that was utilized for the secondary analysis consisted of only those offenders who both entered and successfully graduated the program within the calendar year 2022. There was raw data submitted to VDCJS that was not utilized for statistical analysis because it only included the pre or post test scores. There were also individuals who were not included in the data collection because the offenders were participating in the MAT program, housed in the therapeutic community but based on laboratory testing, the pharmacological interventions were not clinically indicated. The findings were based solely on those offenders who were administered the program in its entirety (both length and components).

One of the themes consistently promoted in a therapeutic community is based on a method known as Socratic questioning (Richardson & Zini, 2021). Socratic questioning facilitates the cognitive restructuring that is necessary to change the negative thoughts and beliefs that contribute to addiction (Richardson & Zini, 2021). Within a therapeutic community, this method of asking probing questions fosters self-reflection, awareness and encourage critical thinking (Richardson & Zini, 2021). The offender population

responds more positively to this method versus direct confrontation. Participants are also able to examine the legitimacy of their criminogenic thinking and consider alternative perspectives from other participants who have been further in the treatment program. Socratic questioning combined with empathetic listening, understanding, and reinforcement of positive change make the therapeutic community an effective, successful environment to promote pro-social, positive thinking patterns and eventually behaviors (Schaefer et al., 2021).

Regarding the validated testing instruments, the brain gauge results that were provided to VDCJS and relevant to the secondary analysis totaled eighteen, which is a small sample size. The sample size included nine males and nine females and ranged in age from 22 to 61. The results remain valuable and positive, but the expectation was for there to be additional scores to analyze. The second and third testing instruments, HAM-A and HAM-D was administered to sixty-six participants which is a more appropriate sample size. The disparity in the total number of scores was due to the delivery method as outlined by the WVRJ Grant stipulations to VDCJS. HAM-A and HAM-D tests are administered by program staff which includes facilitators, counselors or case managers which staff the program 40 hours per week (Hayes, 2022). A licensed practical nurse was designated as the individual who could administer the brain gauge testing and that is only conducted one day per week (Hayes, 2022). While none of the three testing instruments are required to be administered by a qualified provider of services, the research collected and submitted to VDCJS and therefore, secondary analysis content was impacted by the operational policies of the grant facilitators. Of the data collected during the 12-month

period, there were thirty-seven males and twenty-nine females. While ages ranged from 24 years of age to 61, there were forty-two participants (69%) who were between the ages of 24 and 38.

## Treatment Fidelity

The study was conducted as planned with participants enrolled in the MAT program, receiving pharmacological interventions and psychiatric care while being housed in a therapeutic community implementing cognitive behavioral therapy. The program operates with grant funds, there are requirements such as quarterly reporting, outcome measures review and visits from the Coordinator of Adult Justice Programs at VDCJS (Russell, 2020). WVRJ has a program coordinator that evaluates the program who has over two decades of experience treating SUD in individuals who are involved in the justice system (Russell, 2020). The program coordinator as well as provider of clinical services from the community services board audits the components of the MAT program to ensure fidelity to the treatment model (Russell, 2020).

These offenders were administered pre- and post-tests of the HAM-A and HAM-D at the initiation of MAT services and following successful completion of the program. The sample size was less than one hundred but large enough to be able to evaluate the data effectively. The brain gauge was administered as well to the participants as planned. However, results were reported for a smaller sample size (less than 20) based on the length of time required to administer the test and availability of the LPN to complete the sessions. Since the research methodology is secondary analysis, there was no control over the frequency of the cortical metric scans.

One primary challenge came because of COVID-19 and the unique situation that presents in a jail or prison facility. Spread within a facility could be incredibly detrimental and difficult to manage while providing services to the offender population are still required by law and accreditation standards like food service, daily recreation, laundry, medical and mental health services. For this reason, agency administrators had to weigh the benefit of particular activities against the risk of that activity – especially if it required offenders from different housing units to mix. The TCU Criminal Thinking Scale (CTS) was a testing instrument that was intended to be a part of the original results portion of this research project. Based on the curriculum design and best practices for administering the TCU CTS, it was determined that this would not be provided during the period of time data was being collected.

The purpose of administering the TCU CTS is to determine an individual baseline for criminogenic beliefs and attitudes (Sease et al., 2022). The treatment approach should address cognitive patterns and thinking processes that contribute to criminal, maladaptive behavior (Sease et al., 2022). The primary manner in which this is done is through confrontation within a group setting where peers challenge and address distorted, inaccurate thoughts, feelings of victimization and lack of self-awareness (Knight et al., 2006). This is a highly effective method and requires empathy, understanding and through this collaboration, individuals most likely to engage in self-reflection and consider the challenges presented in a supportive and constructive way (Knight et al., 2006). Best practices would dictate that this be completed in a group setting with offenders who had similar scores on the initial CTS and were varied in background,

criminal history, age and life experiences (Sease et al., 2022). The individuals who are enrolled in the MAT program would not necessarily fit that criteria and under normal circumstances would mingle with other offenders who are not necessarily participating in substance abuse treatment. However, this was unable to happen during the pandemic as the facility's paramount concern was preventing the spread of infection and would not permit the mixing of the offender population during this particular time frame.

## Results and Data Discussion

As the data collection progressed, it was less likely that the originally planned analysis method would be the most appropriate. After all the data was collected, a consultation with a research methodologist who specializes in quantitative studies confirmed that multiple regression would not be most effective based on the sample size. When working with a small sample size, utilizing multiple regression can lead to high uncertainty and results that would be widely unpredictable (Warner, 2020). With this technique, you should have a larger, more adequate sample size to ensure proper trustworthiness (Warner, 2020). In consultation with the research methodologist, it was determined that a paired sample *t* test would be the most appropriate since we are considering whether there is a difference in the means of two sets of scores (Warner, 2020). Additional advantages to a paired sample *t* test are that the outcome variable is quantitative and there is a smaller number of participants. Finally, this methodology is most appropriate when there is a measurement taken at two different intervals, which in the case of this research project is the pre- and post-test (HAM-A, HAM-D and brain

gauges), with an intervention (MAT programming) administered between the times (Warner, 2020).

A paired-sample *t* test was conducted on participant scores (with the exception of the TCU Criminal Thinking Scale) at the beginning of the MAT programming and after successful completion of the components to determine if there was a significant difference between the pre- and post-tests. The tables included in the results section are representative of the before and after scoring for participants (including both HAM-A, HAM-D) as well as the cortical metric testing scores in the following categories: speed, accuracy, temporal order judgment, timing and perception, plasticity, fatigue and focus. These categories are listed in the table in order with the pre-test represented by the number one and post-test represented by the number two.

**Table 1**

*Paired Sample Statistics*

| Pair | Category | *M* | *N* | *SD* | *SEM* |
|---|---|---|---|---|---|
| Pair 1 | Accuracy | 74.56 | 18 | 25.180 | 5.935 |
| | Accuracy2 | 80.33 | 18 | 26.402 | 6.223 |
| Pair 2 | TOJ | 46.67 | 18 | 42.217 | 9.951 |
| | TOJ2 | 63.22 | 18 | 43.497 | 10.25. |
| Pair 3 | Time per | 72.06 | 18 | 28.160 | 6.637 |
| | Time per2 | 78.17 | 18 | 18.532 | 4.368 |
| Pair 4 | Plasticity | 61.94 | 18 | 31.358 | 7.391 |
| | Plasticity2 | 77.22 | 18 | 22.525 | 5.309 |
| Pair 5 | Fatigue | 79.39 | 18 | 27.287 | 6.432 |
| | Fatigue2 | 71.56 | 18 | 30.828 | 7.266 |
| Pair 6 | Focus | 69.22 | 18 | 28.711 | 6.767 |
| | Focus2 | 72.44 | 18 | 26.398 | 6.222 |
| Pair 7 | Overall | 61.00 | 18 | 14.369 | 3.387 |
| | Overall2 | 63.50 | 18 | 12.766 | 3.009 |
| Pair 8 | HAM-A | 19.91 | 66 | 11.351 | 1.397 |
| | HAM-A2 | 11.53 | 66 | 10.017 | 1.233 |
| Pair 9 | HAM-D | 13.94 | 66 | 6.935 | .854 |
| | HAM-D2 | 8.73 | 66 | 6.494 | .799 |

Table 1 demonstrates that there was an increase in the scores from pre- and post-test of the categories measured by the brain gauge. Categories such as accuracy, temporal order judgment, time perception, and plasticity had a small increase of mean value from beginning to successful completion of the program. A review of standard deviations indicated that there was a variability of the test scores that was expected and reasonable. The standard error mean, which is used in identifying the upper and lower bounds of the confidence interval and there is normal plus or minus comparison across the sample of participants in the same categories. There was a decrease in scores from the pre- and post-test scores in the category of fatigue and as well as only a slight increase in the focus category. An observation that can be made by reviewing the standard deviation

demonstrates the variability in scores within the sample which could have led to the small increase in means. The variability in scores is not surprising considering the MAT program is for individuals who have been diagnosed with substance use disorder. The spectrum of individuals who are addicted to opioids varies considerably and the level of deterioration of brain health is equally variable. It should be noted that after successful completion of the program, participants are within days of release from incarceration, and it would be reasonable that the stressors associated with returning to the community could impact fatigue and focus.

The differences in the pre- and post-test scores for the HAM-A and HAM-D were larger. The sample size for these tests was larger than that of the brain gauge and the scores direction of change is opposite. In other words, the scores for these tests would get lower over time if an offender's anxiety and depression symptoms improve. The means between the administration of the initial HAM-A and the second was almost 10 points when the expectation of change is 1 and 1.5 which is a significant change. HAM-D testing mean decreased by 6 which was a bigger difference than expected based on the results in Table 1. Finally, the raw scores and these results also indicate that there were several individuals who tested with high levels of anxiety and high levels of depression in the pre-tests which could have impacted the post-test scores even if their symptoms improved.

**Table 2**

*Paired Samples Correlations*

| Pair | Category | *N* | Correlation | Significance one-sided *p* | Significance two-sided *p* |
|---|---|---|---|---|---|
| Pair 1 | Accuracy<br>Accuracy2 | 18 | .173 | .246 | .492 |
| Pair 2 | TOJ<br>TOJ2 | 18 | .269 | .140 | .281 |
| Pair 3 | Time per<br>Time per2 | 18 | .020 | .468 | .937 |
| Pair 4 | Plasticity<br>Plasticity2 | 18 | -.171 | .248 | .496 |
| Pair 5 | Fatigue<br>Fatigue2 | 18 | -.309 | .106 | .213 |
| Pair 6 | Focus<br>Focus2 | 18 | -.141 | .288 | .577 |
| Pair 7 | Overall<br>Overall2 | 18 | .048 | .425 | .850 |
| Pair 8 | HAM-A<br>HAM-A2 | 66 | .702 | <.001 | <.001 |
| Pair 9 | HAM-D<br>HAM-D2 | 66 | .636 | <.001 | <.001 |

Table 2 identifies that there is a low to moderate positive correlation between the pre- and post-tests for the categories of accuracy, temporal order judgement, and time perception of the cortical metric scans. There was a negative correlation between the other categories: plasticity, fatigue and focus which could be due to the individual's numeric score being very low at the pre-test level and very high at the post-test level. There was a review of the raw data scores and that can be confirmed. For example, a participant's plasticity score was zero in the pre-test and ninety-five in the post-test. This would impact the correlation values as could other stressors such as pre-release concerns at the end of their incarceration.

Table 2 demonstrates a highly positive correlation between the pre- and post-test scores for the HAM-A and HAM-D tool. With correlation scores of .702 and .636 respectively, there is indeed a highly positive correlation. The result of the two-sided p test illustrates that the relationship is significant (<.001).

**Table 3**

*Paired Samples Tests*

| Pair | *M* | *SD* | *SEM* | 95% CI lower | 95% CI upper | *t* | *df* | One-sided *p* | Two-sided *p* |
|---|---|---|---|---|---|---|---|---|---|
| Pair 1 | 5.778 | 33.180 | 7.821 | -22.278 | 10.722 | -.739 | 17 | .235 | .470 |
| Pair 2 | 16.556 | 51.835 | 12.218 | -42.332 | 9.221 | -1.355 | 17 | .097 | .193 |
| Pair 3 | 6.111 | 33.398 | 7.872 | -22.719 | 10.497 | -.776 | 17 | .224 | .448 |
| Pair 4 | 15.278 | 41.628 | 9.812 | -350979 | 5.424 | -1.557 | 17 | .069 | .138 |
| Pair 5 | -7.833 | 47.055 | 11.091 | -15.566 | 31.233 | .706 | 17 | .245 | .490 |
| Pair 6 | 3.222 | 41.651 | 9.817 | -23.935 | 17.490 | -.328 | 17 | .373 | .747 |
| Pair 7 | 2.500 | 18.756 | 4.421 | -11.827 | 6.827 | -.565 | 17 | .290 | .579 |
| Pair 8 | -8.379 | 8.340 | 1.027 | 6.328 | 10.429 | 8.161 | 65 | <.001 | <.001 |
| Pair 9 | -5.212 | 5.739 | .706 | 3.801 | 6.623 | 7.378 | 65 | <.001 | <.001 |

Table 3 indicates that while there were not significant differences identified between the paired tests of the categories of the brain gauge, there were increases in the scores from pre- to post-test in all categories except fatigue. Further, in reference to the HAM-A and HAM-D, Table 3 illustrates that with a 95% confidence interval of the difference between the lower and upper scores, the differences were significant. More specifically, for the HAM-A scores, the confidence interval should have been between 6.3 and 10.4 and the mean difference was 8.3 with a p value <0.01 making it significant. For the HAM-D scores, the confidence interval should have been between 3.8 and 6.6 and the mean difference was 5.2 with a p value <0.01 making it significant.

While an additional table is not included, there was a statistical analysis completed that illustrated the results of Cohen's d and Hedges' correction tests that were run which support the discussed findings up until this point. While the results are not included in this section, the upper level of the 95% confidence interval statistics do cross zero which could be beneficial to supplement the secondary analysis.

**Table 4**

*Group Statistics*

| Category | M/F | *M* | *SD* |
|---|---|---|---|
| Speed2 | M | 25.50 | 32.347 |
| | F | 23.67 | 32.332 |
| Accuracy2 | M | 85.25 | 24.185 |
| | F | 94.33 | 5.508 |
| TOJ2 | M | 75.25 | 46.871 |
| | F | 87.33 | 31.939 |
| Time per2 | M | 83.25 | 16.581 |
| | F | 78.00 | 8.544 |
| Plasticity2 | M | 78.75 | 27.585 |
| | F | 81.00 | 22.716 |
| Fatigue2 | M | 72.75 | 23.613 |
| | F | 95.00 | 8.660 |
| Focus2 | M | 72.50 | 32.234 |
| | F | 90.33 | 10.017 |
| Overall2 | M | 67.75 | 18.572 |
| | F | 69.67 | 17.616 |

There was a statistical test comparing the categories of the brain gauge and gender. There does not seem to be any significant differences in gender and the specified categories. However, when reviewing the raw scores and the group statistics, it was identified that the female scores (pre- and post-test) were very close together and had a tighter gap than the male scores in focus, fatigue, judgement, and accuracy. While that

was not an area for investigation in this research project, it may be worth examining in future research.

A statistical review of the raw data was also completed by a quantitative researcher to ensure that there were no issues with reliability. With this particular study, reliability analysis refers to whether the variation in scores is proportionate between the pre- and post-test (before the program and after successful completion). The degree of similarity between the pre- and post-test scores for the HAM-A, HAM-D, and the elements of the brain gauge for each participant can be determined by calculating a correlation coefficient (Statistical Solutions, 2023). There was a high reliability analysis, and an additional observation was that some participants scored high on both Hamilton scales. Therefore, they experienced high levels of anxiety and depression that would have been evaluated by a clinician needing medication and treatment (Belzer & Schneier, 2006). While there was an overall decrease in scores, there were also similarities among participants that scored high for symptoms of anxiety in that those same participants scored high on the depression scale as well.

An independent samples test with Levene's Test for Equality of Variances and *t* test for equality of means will be included in the Appendix as well. These statistical tests further supported the assumptions that have been discussed thus far. Further, Cohen's d, Hedges' correction and Glass's delta tests were run and will be included in the Appendix as well.

## Summary

Since the authorization of residential substance abuse treatment in prison settings in 1994 there have been a variety of treatment programs that combine behavioral health, peer and professional counseling, group therapy, case management and medication assisted treatment to address the co-occurrence of substance abuse disorders and incarceration. Although all programs are structured according to federal guidelines from the Department of Corrections and receive funds from the Bureau for Justice Assistance, there is considerable variability in programming. The programs that provide evidence-based therapeutic interventions, training for correctional staff who work closely with affected inmates, and adequate case management that prioritizes early, pre-release referrals to community-based services, and guarantee follow-up. Diversity in programming, funding distribution and oversight coupled with a highly variable approach to reporting on these programs means that it is difficult to compare efficacy of programs across the board. This serves as both an advantage and disadvantage as programs can be flexible and have autonomy, but standardization prohibits cross comparisons. The state of Virginia would benefit from additional programming with pharmacological interventions and a review of national best practices and intervention methods and outcomes achieving positive results.

Current correctional practices vary with regards to MAT programming. While there are very few jails and prisons that have a comprehensive, holistic medication assisted treatment as defined by the National Institute of Drug Addiction, there are many correctional administrators and medical directors who claim implementation (NIDA,

2019). This misrepresentation comes from their provision for pregnant females with opioid addiction. While the availability of treatment varies depending on the locality, it is clinically indicated to maintain a therapeutic level of methadone or Subutex in the pregnant female and subsequently the baby (Knittel et al., 2020). Both of these medications have diversion potential and create a security issue for the jail. However, a fetus cannot manage the peaks and troughs of withdrawal and there is a high probability of obstetric complications or fetal demise and therefore, the benefits outweigh the risks (Harter, 2019). A medical provider must monitor the dosage and manage withdrawal symptoms carefully while ensuring prenatal care is provided and fetal development remains appropriate (Harter, 2019).

In the state of Virginia, there is a provision for child protective services to assume custody of any infant born with neonatal abstinence syndrome (VDH, 2022). Infants born addicted to opioids will suffer from respiratory issues, increased irritability, seizures and difficulties with feeding (VDH, 2022). Despite these challenges at birth, it is critical that pregnant females receive this MAT medication. However, the argument of this researcher is that it is equally crucial to advocate for improved access to medical and mental health services that address an individual's addiction issues. Policies, practices, and correctional healthcare should prioritize the health and well-being of all individuals incarcerated.

The secondary analysis of this data demonstrated that there was a difference in the pre- and post-test scores. While it was not statistically significant in each area, the participants experienced improved category scores in almost all areas which is indicative of improved brain health. The program components were administered after the offender

took the pre-test and only after successful completion did, they participate in the post-test. The treatment model includes pharmacological interventions, cognitive behavioral therapy and residency in a therapeutic community. The research question or hypothesis was that there will be a difference between the participants brain health, levels of anxiety and depression. Specifically, there will be a positive correlation between the MAT treatment program and decreased levels of anxiety and depression and improved brain health.

Statistical significance and meaningfulness are critical pieces of quantitative research but Walden courses on methodology cautioned us as students to be mindful of seeking it as our solitary objective. Relationships, when not statistically significant or weak correlations, can still be valuable to review and determine if there should be a change in practice. In this research project, the correlation between the pre- and post-test scores was low to moderate but an argument can be made that there would have been more significance with a larger sample which can be accomplished with a longer period of data collection. As an advocate for improved treatments for individuals with substance use disorder that are criminal justice involved, I would make the argument that improvement (of any kind) in the areas measured by these testing instruments makes a positive social change.

In this chapter, the results from the secondary analysis of this research data were discussed as well as the interpretation of the statistical analysis. Based on the results, there was further consideration given to what impact this study may have on future correctional policies and substance abuse treatment while incarcerated. In the final

chapter, there will be an explanation of the limitations of this study and the recommendations for further research as well as implementation considerations for MAT programs within a correctional setting.

# Chapter 5: Discussion, Conclusions, and Recommendations

The state of Virginia promotes the use of MAT, which combines FDA-approved medications such as methadone, buprenorphine, or naltrexone with counseling and behavioral therapies. MAT has shown some effectiveness in reducing opioid use, preventing overdoses, and supporting long-term recovery. These strategies and treatment are evolving as new research is conducted and best practices are developed. The current study added to the literature to promote methadone and suboxone in reducing opioid use and preventing overdose. However, it is vital that there be further consideration of a comprehensive approach to substance abuse treatment that includes an opioid antagonist (naltrexone) and provides an individual with the opportunity to use a medication that does not have addictive properties.

The overrepresentation of individuals incarcerated in the criminal justice system who have substance use disorder is a problem that could provide an opportunity for initiation of MAT treatment. Although this overrepresentation exists, a much lower percentage of these individuals participate in substance use disorder treatment (Tsai & Gu, 2019). Treatment programs need to be developed that increase access for participants, provide incentives for participation, and provide a long-term recovery opportunity for individuals struggling with substance abuse (Tsai & Gu, 2019). Programs such as MAT are important to promote and implement in correctional facilities. Further, the opportunity to use an opioid antagonist, which has no diversion potential, as the FDA-approved medication in a correctional setting would be ideal to promote to jail administrators.

## Overview of the Study

The results of this study indicated that there was a difference in the pretest scores and posttest scores for individuals who participated in and successfully completed the comprehensive MAT treatment program. The relationships varied in statistical significance, but the fact that there was an improvement both in categories measured in the Brain Gauge and reduction in anxiety and depression scores suggests that MAT is effective and could reduce opioid use following release from incarceration. In Chapter 5, I provide a discussion of the recommendations for correctional practices, including provisions for MAT. I also explain the limitations of the study, including validity and generalizability, and the implications for social change.

## Value of the Study

As a response to the opioid epidemic in Virginia, implementation of opioid abatement involved comprehensive efforts to reduce opioid-related deaths and promote prevention, treatment, and recovery (OAA, 2019). Initiatives that were implemented included prescription drug monitoring programs, enhanced data collection and analysis, collaborative partnerships, and education and treatment programs (OAA, 2019). A statewide database tracks prescriptions for controlled substances, which is known as a prescription drug monitoring program. The database allows clinicians to identify drug misuse, prevent drug-seeking patients, and provide law enforcement with an opportunity to closely monitor the health care providers who are overprescribing narcotics (OAA, 2019). Enhanced data collection and analysis are being conducted from a variety of agencies including medical examiners and emergency calls for service by health care and

law enforcement to determine whether there are trends or hot spots and to direct resources where appropriate (OAA, 2019). The extent of this crisis has promoted a more collaborative partnership between agencies that historically have operated in silos. Virginia has also expanded efforts to expand prevention and education through campaigns targeting everyone from students in elementary school to health care providers and raising community awareness for opioid misuse for chronic illness (OAA, 2019).

There are several portions of opioid abatement in Virginia that relate to the MAT program addressed in the current study. They include harm-reduction programs that provide support for individuals who use and abuse opioids, such as needle disposal services, referrals to treatment, and other support services (OAA, 2019). These programs aim to prevent the spread of infectious diseases and promote pharmacological interventions that aid in treatment. Most importantly, opioid abatement in Virginia promotes the expansion of number and type of treatment services, support community-based initiatives, and peer recovery services (OAA, 2019). The MAT program offered at WVRJ not only incorporates those components but also produces positive results in the offender population.

With the secondary analysis completed and the results demonstrating an improvement in pre- and posttest scores, this study may be used as justification for duplicating the MAT program in other facilities. There are several potential sources of funding for drug treatment in the Commonwealth of Virginia, including donations, local funding, nonprofit organizations, and private insurance (Cuellar & Hazel, 2021). Certain financial resources are somewhat localized and do not typically contribute funds to a jail

because they are government entities. Medicaid expansion has increased access to substance abuse treatment services and allows for reimbursement of treatment providers, which could be beneficial to a jail-based program (Cuellar & Hazel, 2021). The reality is that clinicians who are experienced in the treatment of substance use disorder earn considerably more than the reimbursement rate from Medicaid and are therefore unwilling to serve the offender population (Cuellar & Hazel, 2021).

Virginia receives funding in the form of grants from the federal government to support substance abuse treatment and prevention programs. The Virginia Department of Behavioral Health and Developmental Services administers these funds and distributes them to various organizations and agencies across the state (Cunningham et al., 2019). State funding can also be provided to support substance abuse treatment and prevention initiatives (Cunningham et al., 2019). These grant funds are typically provided only after a lengthy application process in which an agency has to demonstrate their need, treatment modalities, and program components based on evidence-based practices and a detailed financial plan (Cunningham et al., 2019). The current study could be submitted either as a blueprint to model a future MAT program or as supporting evidence of why a successful program should include a pharmacological intervention, medical treatment, counseling, and a therapeutic community.

Implementation and operational success will be critical in educating other correctional administrators as well as in establishing rapport and building essential professional relationships to assist with new program implementation. The MAT program that is the subject of this secondary analysis incorporated consultation with stakeholders

in the treatment of substance abuse (from clinicians, recovering addicts, medical professionals, counselors, and law enforcement and other criminal justice practitioners). Future research could incorporate feedback from graduates of this program and other individuals in different stages of recovery to contribute to future programming and services.

This research has the potential to create positive social change in the substance abuse treatment community and corrections. When you take a comprehensive approach to a public health issue and include all relevant parties there is a higher probability of success. Operating in a silo and creating a program that fails to address the totality of substance abuse, is not supported by the judiciary, or cannot be implemented because of misinformation or lack of support. This research can provide quantitative data to guide future spending of re-entry financial resources as well as provide criminal justice practitioners with a blueprint to effectively treat substance abuse during incarceration and further successful re-entry into the community and therefore, reducing recidivism.

This specific MAT program is advertised to participants, practitioners, and others as lasting approximately ninety to one hundred and twenty days. The clinicians who administer the program identify under one-hundred days completion as being extremely rare and not realistic based on the significant amount of internal work that needs to be done to completely overhaul the mindset of an addict. In addition, there are consequences for violating the rules of the programs and in some instances, which is suspension from the program for 10 or more days. Finally, the program operates as a rolling enrollment which means that upon a successful completion, voluntary removal, suspension or

termination, there are several offenders waiting to be admitted. Program coordinators ensure that new offenders are paired with offenders who have been participating and performing well. The availability and implementation of therapeutic communities within jails can vary depending on the jurisdiction and facility space. Some facilities, like WVRJ, have dedicated units specifically designed for this treatment approach.

There is benefit to this study because it was completed with a focus on the correctional setting and by practitioners who are security minded. The results clearly identified a benefit to a comprehensive MAT program that utilized an opioid antagonist which has no diversion potential. Therefore, this intervention presents no additional security risk among the offender population. Based on the fact that the opioid antagonist does not create a euphoric effect, it would not be sought after as a commodity within the facility.

## Synthesize

In my graduate studies at a separate university, the primary focus was on fundamental understanding and overall comprehension of theoretical concepts, basic research methodologies, and significant subcategories within a selected field of study. While this provided valuable information and that foundation is critical for future academic and professional pursuits, one beneficial theme consistent throughout doctoral program-both the course work and certainly during the dissertation process-was a commitment to positive social change. Doctoral candidates are consistently encouraged as students to focus on the potential for long-term, lasting positive impact of their

academic and professional pursuits. There has not been one instance of scholarship for learning's sake. As the research study is concluded, it seems prudent to review these components to ensure that it was not conducted for the sake of simply adding to the literature but that there was indeed a contribution to positive social change.

Medication Assisted Treatment is not, nor at its best be a 'magic bullet' that will eliminate substance abuse or addiction. Opioid addiction has reached the level of a public health crisis and requires complex solutions. This comprehensive approach to treatment of substance use disorder is unique because it is not only addressing the clinical needs of a patient but the underlying reasons for addiction and provides valuable supplemental medication and mental health treatment. Complex problems require breaking apart sections and analyzing them, addressing each component (Walden University, 2012). Brain health is a significant part of the complex puzzle that is addiction treatment that is not addressed sufficiently in the literature. This study sheds light on the importance of investigating how abuse of opioids hijacks and harms portions of the brain that must be repaired and for those of us who are not neuroscientists, can be explained simply as 'rewiring' (Wenzel et al., 2016).

Secondly, the skills that are necessary to effect positive social change include such active verbs as practice, collaboration, advocacy, and civic engagement (Walden University, 2012). RSAT-MAT at WVRJ was designed by an incredibly knowledgeable and invested group of practitioners, clinicians, advocates, and peers who were living in recovery (Russell, 2020). One obstacle in the provision for SUD treatment is overcoming and educating stakeholders and correctional administrators that those suffering are not

criminals and moral failures who need punishment but that they are people with a treatable medical condition (Dopesick, 2018). It takes a significant amount of collaboration of subject matter experts, who should include peer recovery specialists who have been incarcerated, addiction specialists, and advocates to develop a successful treatment program that succeeds (Dopesick, 2018). Higher education identifies civic engagement as important to positive social change and RSAT-MAT has been promoted in a similar fashion. The judiciary has seen the successful completions and the effectiveness and value of the program in the eyes of the graduates (Clemens, 2022). The program coordinators have presented to the bar associations and treatment providers in other localities about RSAT-MAT, the population that can benefit and what makes it unique as a treatment modality (Clemens, 2022). Finally, there is a need for continued evaluation of the RSAT-MAT program to ensure fidelity to the treatment with the pharmacological interventions, curriculum delivery, components of the therapeutic community and medical and mental health treatment.

The third section of social change involves attitudes, namely humane ethics (2012). While individuals pursue research and contribute positively to their community, church, workplace or abroad for a variety of reasons that are impacted by life experiences, emotions, personal beliefs, etc., it is always of the utmost importance to treat all individuals with compassion, dignity, and respect (Walden University, 2012). In the case of future research with this population, there must be considerable attention paid to the fact that they are a vulnerable population both as incarcerated individuals and they are suffering from substance use disorder. This study utilized secondary analysis and

therefore, there were no concerns with regard to harm to the subjects. If qualitative or mixed methods studies are performed in the future with this particular program, it would be prudent to ensure that the data collection method was considerate of the target population and caused no intentional harm.

## Implications for Practice

While the opioid crisis continues to contribute to overdose deaths at an alarming rate, approximately 91,000 deaths in 2020 which is a thirty percent increase from 2019 (CDC, 2023). Opioids accounted for seventy-five percent of those drug overdoses nationwide with 2240 of those being in Virginia in 2020 (CDC, 2023). While these figures are continuing to increase, they are likely not representative of all opioid related deaths. These statistics do not consider deaths resulting from complications from hepatitis C, HIV, endocarditis, respiratory failure, and addiction-related suicide (Dopesick, 2018). Despite these figures, it is still challenging to implement medication-assisted treatment into the criminal justice system, specifically jails. The Substance Abuse and Mental Health Services Administration, SAMHSA, identifies six barriers to implementation despite evidence demonstrating the positive results of MAT for the offender population (2023).

One such barrier is insufficient funding to provide MAT medications to offenders is being addressed within the state (2023). There is an increase in grant funding available in Virginia and other federal sources that are being made available as lawsuit settlements from pharmaceutical companies are being determined but are not available as a part of

the Governor's budget that is automatically funneled into the operational budget of a facility (OAA, 2021).

Another barrier which is challenging for correctional administrators and beyond their control at this time is the requirement that they must be registered with the U.S. Drug Enforcement Agency as an Opioid Treatment Program (SAMHSA, 2023). This process is arduous, and an agency would have to comply with 42 Code of Federal Regulations (CFR) 8 in order to be certified and accredited (SAMHSA, 2023). These are separate and apart to the state regulations from the Department of Corrections and national accreditation standards from the Federal Bureau of Prisons and American Correctional Association. Public safety agencies are struggling at this time to maintain staffing levels and additional duties and tasks would further burden these officers.

Despite those previous challenges, there are several barriers that would be straight forward and effortless for a correctional facility based on the current availability of funds and model programs that are successfully operating in Virginia. Barriers such as misinformation or lack of understanding and correctional medical policies prohibiting the use of controlled substances could be addressed by working with the Department of Criminal Justice Services and current program coordinators to provide training and inform policy changes (SAMHSA, 2023). Concerns about security and the risk of diversion is a significant barrier for many correctional administrators (SAMHSA, 2023). However, the use of Naltrexone (or injectable Vivitrol) would resolve that barrier as the medication does not have addictive properties, nor does it cause feelings of euphoria or have sedative properties-all of which encourage diversion to other individuals within the

facility (Bahji,et al., 2019). As an opioid antagonist, Naltrexone has no diversion potential, nor does it require a specialized licensure for the medical provider as it is not a controlled substance (SAMHSA, 2023).

There has been an increased focus and financial resources committed to harm reduction strategies such as opioid substitution therapies which provides methadone and buprenorphine, as substitutes for the illicit opioid being used (Hawk, et al., 2015). While these substitutes help reduce withdrawal symptoms and cravings and decrease the harm associated with illegal drug use, it does not provide an individual with the tools necessary to promote long-term recovery. Also, worth noting is that the withdrawal from methadone and buprenorphine is reportedly so painful and intimidating to the individual, that they maintain on the medication despite wanting to stop the treatment (Kleber, 2007). Pharmacological intervention without additional efforts to promote treatment and recovery cannot address underlying issues contributing to opioid use and improve overall well-being. For this reason, this harm-reduction strategy has contributed to the presumption that MAT is simply 'substituting one drug for another' (Kleber, 2007).

The fact that the participants are receiving MAT services while participating in a therapeutic community is significant and could easily be implemented in a correctional setting without an impact on security operations. The offenders that are provided treatment in this setting have been shown to have lower reincarceration rates (Wexler et al., 1990). The therapeutic community is a safe and supportive environment that promotes healing and resiliency through components such as safety, choice, empowerment, cultural sensitivity, trauma-specific services and trustworthiness

(Marchand et al., 2019). These components are similar to that of another evidence-based treatment, trauma-informed care (Harris & Fallot, 2001).

Trauma-informed care in corrections is an approach that recognizes and addresses the impact of trauma on the offender population (Marchard et al., 2019). This provision for treatment acknowledges that many incarcerated individuals have experienced significant trauma in their lives which had a profound effect on a person's mental, emotional, and physical health (Harris & Fallot, 2001). By adopting trauma-informed care principles with the offender population and educating the staff on this treatment modality, correctional facilities can better support the rehabilitation and well-being of incarcerated individuals. This approach within the therapeutic community acknowledges the complex needs of the victims of trauma and attempts to provide an environment that fosters healing, growth, and successful reintegration into the community after release (Marchard et al., 2019).

The facility that was the focus of this research study provides Narcan (naloxone) to the offenders who are leaving incarceration in an attempt to support harm reduction strategies. They also provide the correctional security staff with training on recognizing the signs and symptoms of opioid overdose and administration of Narcan. An implementation of this practice throughout the state of Virginia would be beneficial and cost-effective as many agencies can request Narcan from the local Department of Health and obtain it at no cost to the agency (VDH, 2023).

This research study could prove significant in addressing a number of these barriers from providing relevant education to staff and administrators correcting

misinformation, discussion regarding the lack of diversion potential for an opioid antagonist to encouraging implementation with statistical data on the magnitude of the problem (SAMHSA, 2023). Further, it is important to advise correctional administrators that there are opportunities to provide treatment to the offender population suffering from SUD without jeopardizing institutional order or security (Bahju et al., 2019). Lastly, utilize current research that demonstrates how providing MAT during incarceration reduced opioid relapses, increased retention in treatment as well as a decrease in re-incarceration (Bahji et al., 2019).

## Findings

The findings of this secondary analysis confirm that a comprehensive, holistic treatment program has a positive impact on the participants as demonstrated by the change in scores for the pre- and post-tests. The statistical analysis demonstrates that the components offered in this particular program are effective and promote sustained recovery by improving overall brain and mental health.

Through statistical analysis, there are measures in which to verify important concepts in quantitative methodology. One such concept is validity, which refers to the extent to which a tool measures what it intends to measure. If a tool accurately measures a concept, such as anxiety or depression, it would be a valid instrument. Thus, it would be understood that the results of that testing instrument and the interpretations of those findings would be valid.

## Recommendations for Further Research

Since the authorization of residential substance abuse treatment in prison settings in 1994, there have been a variety of treatment programs that combine behavioral health-peer and professional counseling, group therapy, case management and medication assisted treatment to address the coincidence of substance abuse disorders and incarceration. Although all programs are structured according to federal guidelines from the Department of Corrections and receive funds from the Bureau of Justice Assistance, there is considerable variability in programming. The programs that provide the best outcomes for individuals living with substance abuse disorders are those that provide the best outcomes for individuals living with substance use disorders are those that provide evidence-based therapeutic interventions, training for correctional staff who work closely with affected offenders, and adequate case management that prioritizes early, pre-release referrals to community-based services, and regular follow-up and sustained support. Diversity in programming, funding distribution and oversight coupled with a highly variable approach to reporting on these programs means that it is difficult to compare efficacy of programs across the board as well as isolate which elements make the most significant impact on abstinence over time. Additionally, the state of Virginia would benefit from additional investigation of intervention methods and outcomes.

The secondary analysis completed for this study could also be significant over a longer period of time, for instance as a longitudinal study. A longitudinal study would be advantageous in determining what changes could be observed in the long-term among the participants. It would be interesting to see if the scores for these evidence-based testing

instruments level out over time and create an individual's baseline or if they would continue to trend in a positive direction.

While it is important to promote MAT as an integral part of correctional practice and judicial decision-making, there are some other opportunities for future research that could be completed without the time constraints of a doctoral project. It would be beneficial to see what other states are providing in the way of MAT services, especially within a correctional setting. Examining the components of their services and making a comparison between various state programming would be beneficial. There are different provisions within each state code as well as financial resources and grant opportunities that would be constructive to review.

Qualitative research such as natural observations, personal interviews addressing exploratory questions and subjective concepts is a valuable type of research utilized by social scientists. Qualitative research is essential in determining the "how" and "why" of certain behaviors. In this context, it would be beneficial to speak with the offender participants and determine what the underlying causes of their addiction were. It would also be helpful to inquire about qualitative elements such as hope, cravings, shame and other emotions associated with treatment of substance use disorder.

## Reflection on Social Change

Annual data submitted by the Virginia Association of Regional Jails in 2017 indicated that over 80% of the offender population in these 21 facilities have substance abuse issues. The survey also highlighted that substance abuse was the largest contributor to recidivism according to self-report, probation and parole and intake information.

Further, substance use disorder contributes to overcrowding in correctional facilities of non-violent offenders and perpetuates a revolving door cycle. Finally, research showed that the overdose rate for incarcerated populations is continuing to rise. In order to make a positive impact on this population, it is essential that criminal justice practitioners, advocates, clinicians and other stakeholders collaboratively address substance abuse. My dissertation topic exploring the impact of a holistic, comprehensive medication assisted treatment program utilizing an opioid antagonist, other nutritional supplements, cognitive behavior therapy and psychiatric care is one manner in which to do that. Professionally, I want my research to serve as a catalyst to criminal justice and correctional administrators as support for implementation of MAT with no diversion concerns and a blueprint that can simply be duplicated. As an individual, I want to develop a program that allows for success after incarceration, provides treatment (beyond abstinence) while incarceration beyond pharmacological intervention but encourages cognitive behavioral and thinking changes and provides an addict with something they indicate they don't have before treatment…hope. The goal of this program is not only to reduce recidivism but to return these individuals to a quality of life where they can be a parent, child, spouse, employee who can show others what resiliency is and hopefully, pay it forward to someone else. This is how I see my doctoral journey as creating positive social change.

## Recommendations for Practice

The advancement of psychopharmacological therapies has been helpful in creating better solutions for medication assisted treatment. Adding a medical intervention to the use of behavioral interventions while offenders are incarcerated is significant in the

successful re-entry of individuals suffering from substance use disorder. Providing clinical education to correctional administrators will be essential in changing perceptions and potentially, correctional practices.

Moving forward, the points of contact who are the most knowledgeable with issues that pertain to Residential Substance Abuse Treatment and Medication Assisted Treatment programs are involved in fund distribution decision-making. Unfortunately, there are fewer of these individuals who report sufficient participation in state policy issues that are relevant to substance abuse treatment and correctional management (Stainbrook et al., 2017).

Correctional officers work constantly with the offender population and individuals who are incarcerated in these programs, unlike clinical and medical staff who are only present during normal business hours. For this reason, correctional administrators should consider assigning officers that are dedicated to the units housing these programs and provide relevant training since their interactions with these offenders can advance treatment or adversely impact their recovery. Finally, the effectiveness and longevity of residential substance abuse treatment programs will rest on an agency's ability to provide continuity of care to incarcerated offenders who have successfully participated in medication assisted treatment and link them to community-based treatment providers.

Harvard Institute of Politics completed a study in 2019 in which they concluded that there were numerous factors that impact an offender's ability to re-enter society successfully such as health, housing, mentorship, etc. (Harvard University, 2019). The

study summarizes these various factors into three predominant categories: basic needs, opportunity and social support and accountability which are interconnected (Harvard University, 2019). Each of these categories requires the offenders' personal desire to rehabilitate, change old, destructive thought and behavior patterns and abstain from illegal substances. Each individual participant must play an active role in their recovery journey and no program component, no pharmacological intervention or evidence-based curriculum will be enough to treat an individual who does not have the desire to make significant changes for their recovery.

Frances Chan, an evangelical author, and pastor, is frequently quoted as saying "our greatest fear should not be failure but of succeeding at things in life that don't really matter." To his point, individuals who are passionate about individuals struggling with substance abuse, corrections, or the criminal justice system should be heartened to provide effective, comprehensive treatment that will make a significant, lasting change. Harm reduction strategies and incarceration may save lives, but it does nothing to promote a higher quality of life for individuals, which should be the ultimate goal.

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# Appendix A

## Raw Data Table for SPSS – Cortical Metric/Brain Gauge

| Speed | Accuracy | TOJ | Time Per | Plasticity | Fatigue | Focus | Overall | Speed2 | Accuracy2 | TOJ2 | Time Per2 | Plasticity2 | Fatigue2 | Focus2 | Overall2 | M/F |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 40 | 54 | 100 | 33 | 47 | 74 | 49 | 5 | 49 | 100 | 63 | 40 | 85 | 26 | 48 | M |
| 6 | 93 | 100 | 60 | 76 | 100 | 53 | 65 | 5 | 98 | 100 | 100 | 99 | 53 | 85 | 73 | F |
| 5 | 51 | 62 | 70 | 55 | 88 | 100 | 60 | 5 | 94 | 100 | 77 | 55 | 100 | 80 | 51 | F |
| 10 | 62 | 5 | 23 | 61 | 100 | 6 | 34 | 5 | 89 | 100 | 70 | 91 | 85 | 91 | 72 | M |
| 31 | 84 | 62 | 100 | 69 | 100 | 46 | 66 | 19 | 96 | 5 | 93 | 78 | 53 | 79 | 59 | F |
| 30 | 69 | 0 | 73 | 66 | 34 | 100 | 63 | 73 | 98 | 96 | 77 | 98 | 100 | 100 | 91 | M |
| 60 | 87 | 62 | 43 | 90 | 100 | 96 | 77 | 61 | 100 | 62 | 87 | 97 | 100 | 100 | 86 | F |
| 78 | 100 | 100 | 93 | 0 | 80 | 100 | 92 | 14 | 100 | 100 | 80 | 95 | 62 | 5 | 58 | F |
| 44 | 96 | 5 | 47 | 97 | 73 | 100 | 67 | 5 | 84 | 92 | 80 | 69 | 68 | 100 | 62 | M |
| 48 | 92 | 100 | 93 | 86 | 100 | 85 | 84 | 5 | 98 | 100 | 93 | 98 | 5 | 77 | 65 | M |
| 5 | 56 | 5 | 100 | 49 | 100 | 47 | 49 | 6 | 97 | 98 | 100 | 98 | 100 | 79 | 77 | M |
| 38 | 65 | 5 | 63 | 70 | 100 | 53 | 55 | 55 | 5 | 5 | 37 | 36 | 96 | 44 | 56 | F |
| 16 | 71 | 100 | 100 | 77 | 53 | 68 | 64 | 17 | 55 | 84 | 93 | 61 | 100 | 54 | 63 | F |
| 25 | 89 | 5 | 77 | 89 | 100 | 53 | 60 | 41 | 89 | 5 | 57 | 84 | 53 | 83 | 59 | F |
| 5 | 82 | 70 | 5 | 86 | 100 | 29 | 49 | 5 | 42 | 76 | 100 | 38 | 70 | 96 | 60 | F |
| 5 | 100 | 5 | 80 | 97 | 92 | 98 | 66 | 16 | 67 | 5 | 53 | 72 | 5 | 59 | 39 | M |
| 5 | 100 | 100 | 100 | 0 | 25 | 47 | 58 | 27 | 96 | 5 | 90 | 97 | 100 | 63 | 65 | M |
| 10 | 5 | 0 | 70 | 14 | 37 | 91 | 40 | 41 | 89 | 5 | 57 | 84 | 53 | 83 | 59 | M |

# Appendix B

## WVRJ Collaboration Agreement

*Memorandum*

*To:* *Superintendent D. F. Cox*

*From:* *Amanda K. Trent, Doctoral Candidate, Walden*

*Subject:* *University Collaboration Agreement 2021-23*

*The purpose of this memo is to outline the dissertation research project and outline the collaborative requirements for each participant. I am requesting permission to complete a quantitative research study to determine the effectiveness of implementing medication assisted treatment, specifically the use of an opioid antagonist, Naltrexone, in a correctional setting in addressing long-term recovery once released from incarceration. Variables such as cognitive behavioral therapy, specialized, regular psychiatric care combined with pharmacological interventions such as supplemental medications and an opioid antagonist will be evaluated to determine if there's a positive correlation between those variables and long-term recovery. This research will determine if this pharmacological intervention combined with supplemental medications and instruction on the holistic approach and treating an offender from a disease model perspective. More specifically, after a secondary analysis of the quantitative data that this dissertation project seeks to review, what will be the impact of this comprehensive approach have on the participants?*

*Obligations of the Researcher will include:*

- *Complete the capstone project under the supervisor of the faculty member and within the guidelines set forth by the Superintendent of the Western Virginia Regional Jail;*
- *Seek guidance and approval of the Institutional Review Board;*
- *Write a research proposal and submit it to the members for review, make any changes*
- *Review/perform secondary analysis on information submitted on the RSAT-MAT program to the Department of Criminal Justice Services;*
- *Complete and submit by the end of the dissertation process a completed research project which will be published by Walden University but will also be reviewed prior to publication by the Superintendent of the Western Virginia Regional Jail*

*Obligations of the Jail Administrator will include:*

- *Supervise and mentor the student on the agreed-upon deliverables (research proposal) as well as the research objectives and outcomes outlined in the project description;*
- *Allow RSAT-MAT program coordinator to disseminate the quarterly progress reports submitted to the Department of Criminal Justice Services;*
- *Allow RSAT-MAT program coordinator, Jail Physician or Health Services Administrator to participate in discussions when necessary to discuss the research progress & findings.*

11-9-21