AN EXAMINATION OF THE EFFECT OF RECENT SUBSTANCE ABUSE
TREATMENT ON CURRENT OPIOID USE

by

Cynthia Michelle Bass-Thomas

A Dissertation Submitted in Partial Fulfillment of

the Requirements for the Degree of

Doctor of Philosophy in Health and Human Performance

Middle Tennessee State University

May 2019

Dissertation Committee:

Dr. Andrew Owusu, Chair

Dr. Angela Bowman

Dr. Michelle Stevens

Dr. Chandra Story

I dedicate this manuscript to my personal angels MaDea, Daddy, and Shirley I

love you. In addition, to my husband Marvin, daughter Mimi, sister's Marcia and

Beverly: thank you for the strength, encouragement and love I needed

throughout this tedious journey. You always reminded me I will be victorious.

Thank you, I love you all.

ACKNOWLEDGEMENTS

I would like to thank God; for without him, this would not be possible. Dr. Andrew Owusu, you are an awesome professor, mentor, advisor, guide, and friend. Thank you for pushing me beyond my potential regardless of the resistance I exhibited. My family and I respect and appreciate you.

Also, I would like to thank and recognize my dissertation committee, Dr. Angela Bowman, Dr. Chandra Story, and Dr. Michelle Stevens for believing I could make it through this challenge and sticking with me all the way. I love and appreciate you.

Dr. Marquinta (Que) Harvey, thanks for the knowledge and support you continuously share with me. Amber Dorsey, your faith is strong enough for a multitude of people; I am grateful you consistently pray for me. You ladies have been motivating forces from the beginning of this process. You are my spiritual daughters.

Thank you to all the other supporters that have poured into me with a kind word. I appreciate you.

ABSTRACT

The opioid epidemic in the United States has become a public health crisis affecting many American communities. Effective treatment is vital in fighting the opioid epidemic. Existing evidence suggests that providing opioid users with opioid treatment programs (OTPs) is an effective method of treatment that will also provide these users with the best health and social outcomes.

A significant barrier to treatment for opioid abusers is access to treatment. The focus of this study was to examine if substance abuse and mental health treatment in the past 12 months have an effect on the amount of days of current opioid use when controlling for age, gender, race/ethnicity, health insurance, and employment. Current opioid use is defined as one to thirty days (1- 30 days) in this study.

The data source consisted of the 2016 National Survey on Drug Use and Health (NSDUH). Prevalence estimates were calculated using a Factorial Analysis of Variance to assess the effect of substance abuse and mental health treatment as directed by this study. The study results for examining if substance abuse and mental health treatment in the past 12 months had an effect on the amount of days of current opioid use indicated a statistically significant difference ($F(1, 86) = 4.332$, $p =.040$), accounting for (8.9%) of the variance.

TABLE OF CONTENTS

List of Tables

List of Figures

CHAPTER I: INTRODUCTION

Overview

Each year, drug abuse causes millions of serious illnesses and/or injuries among Americans (CDC, 2017). The United States Department of Justice National Drug Intelligence Center (2011) reports that addiction to drugs (i.e., alcohol, nicotine, illicit and prescription drugs) cost the United States over $700 billion per year in medical cost, lost wages, and criminal offenses (The United States Department of Justice National Drug Intelligence Center, 2011; Birnbaum et al., 2011). The Centers for Disease Control and Prevention (CDC) estimates that the total "economic burden" of prescription opioid misuse alone in the United States is $78.5 billion a year, including the costs of healthcare, lost productivity, addiction treatment, and criminal justice involvement (Florence, Zhou, Luo, & Xu, 2016). Specific to heroin use in 2015, the societal (i.e., taxpayers' financial burden) cost of heroin use in the United States was estimated to be $51.2 billion for 1,008,000 heroin users: an average of $50,799 per user (Jiang, Lee, Lee, & Pickard 2017).

Heroin and prescription opioid pain relievers both are included in the opioid class of drugs. When opioids bind to mu opioid receptors (MOR) in the brain it creates a euphoric effect (NIDA, 2018). There is a refractory mechanism to drug addiction (i.e. a resistance to stop using drugs) and no known cure. However, it is a treatable disease that is manageable (NIDA, 2016). The term "addiction" as used in this current research study relates to substance use

disorder (SUD). The Diagnostic and Statistical Manual of Mental Disorders (5th ed.; DSM–5; American Psychiatric Association, 2013) is the most widely accepted nomenclature used by clinicians and researchers for the classification of mental disorders, has defined SUD as the inability to control the impulse to use drugs despite negative consequences.

Opioid users become dependent on these drugs because of addiction brought about by a few common causes. The National Institute on Drug Abuse (NIDA) defines "addiction" as "a chronic, relapsing brain disease that is characterized by compulsive drug seeking and use, despite harmful consequences" (NIDA, 2014, p. 5). Addiction is considered a brain disease because drugs can change the structure of the brain and how it works. These brain changes can be long-lasting and can lead to the harmful behaviors seen in people who abuse drugs" (NIDA, 2014, p. 5).

Addictions often have one or more associated health issues, which could include lung or heart disease, stroke, cancer, or mental health conditions (NIDA, 2018). Opioids can be extremely addictive and dangerous, putting users at risk for other adverse health effects, especially when taken along with other drugs or alcohol (NIDA, 2015). Using opioids and other drugs can also increase the risk of contracting infections. Human immunodeficiency virus (HIV) and Hepatitis C (a serious liver disease) infections can occur from sharing injection equipment and from impaired judgment leading to unsafe sexual activity (El-Bassel, 2014). Researcher Nora Volkow of the National Institute on Drug Abuse (2014),

conducted a research study on treating the disease of addiction as a medical condition. The study results indicated that addiction is a treatable medical condition such as diabetes and other medical diseases (NIDA, 2014, p. 25).

Addiction has many causes and one that has affected many addicts is trauma. Trauma is also associated with SUD. Lawson et al., 2014 conducted a research study on outpatient substance abuse participants assigned to three distinct groups (i.e., opioids, cocaine, and nicotine). The study results showed participants that abused substances are at elevated risk of suffering from traumatic experiences than those without a history of drug use (Lawson et al., 2014). The research study also found that the first traumatic event occurred at an earlier age for individuals who use opioid prescriptions than participants in the cocaine and nicotine groups (Lawson et al., 2014). Adverse childhood experiences (ACE) are another factor that contributes to the opioid epidemic. Substance Abuse and Mental Health Services Administration (SAMHSA) defines ACE "as stressful or traumatic events, including abuse and neglect. They may also include household dysfunction such as witnessing domestic violence or growing up with family members who have SUD" (SAMHSA, 2018). According to researcher Prewitt (2017), ACE's are at the root of the opioid crisis with adequate treatment needed for both SUD and ACE (Prewitt, 2017).

Drug addiction is a treatable disease and those impacted by drug addiction need access to medications for treatment (NIDA, 2014, p. 25).Because of the rampant addiction contributing to the current opioid epidemic there is a

need for greater access to treatment among addicts. According to the US Department of Health and Human Services (DHHS), at least 2 million Americans have an opioid use disorder (OUD) involving prescribed opioids. Nearly, 600,000 have an OUD involving heroin, with about 115 Americans dying every day from overdoses that involve an opioid (The Centers for Disease Control and Prevention, 2017; National Center for Health Statistics, 2017).

Many people have lost their lives to an opioid overdose. Fatal opioid overdose does not discriminate between race/ethnicity, gender, socioeconomic status, education, or religion (Hawk, Vaca, & D'Onofrio, 2015). Every 20 minutes opioid overdose cause one death (Rudd et al., 2016). The CDC indicates the increase in opioid overdose results from the transition of prescription pain relievers to heroin (CDC, 2015).

Opioids are a schedule II class drug (drugs with a high potential for abuse, with use potentially leading to severe psychological or physical dependence) (DEA / Drug Scheduling, 2018) that includes the illicit drug heroin as well as the illicit prescription pain relievers consisting of oxycodone, hydrocodone, codeine, morphine, fentanyl, and others (NIDA, 2018).

There has been an increase in heroin use which is contributing to the opioid epidemic, because prescription opioids are more expensive than the purchase of heroin from a drug dealer (DEA, 2013). Past misuse of prescription opioid pain relievers is the greatest risk factor for initiation of heroin use, particularly among persons who reported past-year dependence or abuse

(Jones, Logan, Gladden, & Bohm, 2015). A significant number of individuals with opioid addictions started with the abuse of prescription opioids, then substitute heroin for prescriptions pain relievers because heroin is cheaper (Cicero et al., 2014; Muhuri, Gfroerer, & Davies, 2013). In one study, approximately 80.0% of current heroin users reported that they began with prescription opioids, leading researches to see the public health effects of prescription opioids and heroin are intertwined (Muhuri et al., 2013; Kolodny et al., 2015).

People who abuse opioid prescriptions acquire their drugs from someone they know. According to data from the 2014 National Survey on Drug Use and Health (NSDUH 2014), 4.3 million Americans engaged in non-medical use of prescription pain relievers in the month preceding the survey, while 1.4 million people used prescription pain relievers non-medically for the first time in the preceding 12 months (SAMHSA, 2014). Individuals often obtain prescription analgesics for non-medical use from a relative, doctor or provider or other sources (DEA, 2016b; Hughes et al., 2016; Kennedy-Hendricks et al., 2016). Hydrocodone is the most commonly prescribed opioid pain reliever; primarily for dental and injury-related pain (Jones, Lurie, & Throckmorton, 2016).

Fentanyl and prescription pills sold on the illicit drug market increase the chances of severe medical issues. Fentanyl is a deadly synthetic opioid that is 80-100 times stronger than morphine. According to the Drug Enforcement Administration, Fentanyl was developed for pharmaceutical purposes to help with pain management for cancer patients ("Fentanyl," n.d.). Fentanyl began being

abused among drug users because of the potency of opioid properties. Most prescription pain relievers are dispensed orally in pill (tablets or capsule) form, but abusers sometimes crush the pills to develop a powder form to snort or inject. The substances are immediately released into the bloodstream creating an intensifying effect to the brain (NIDA, 2015). Injecting or snorting prescription pain relievers increases the euphoria, but also increases the risk for serious medical complications, such as respiratory arrest, coma, and addiction (Volkow, Frieden, Hyde, & Cha, 2014).

The risk involved in crushing prescription pain pills for injecting or snorting led pharmaceutical companies to make vital changes in opioid prescription pills with abuse-deterrent extended-release oxycodone hydrochloride and to withdraw propoxyphene from the U.S. market (Larochelle, Zhang, Ross-Degnan, Wharam, 2015). The implementation of extended-release opioid prescription pain relievers led to a decrease in opioid prescription overdose, but this did not affect heroin use. (Kuehn, 2013; SAMHSA, 2015). The timing and duration of opioid use lead to different effects on the user (Cicero, Ellis, Surratt, & Kurtz, 2014).

The United States is in the midst of an opioid overdose epidemic and action must be taken to thwart these dramatic statistics (Kolodny et al., 2015). The majority of drug overdose deaths (66%) involve an opioid. In 2016, the number of overdose deaths involving opioids (i.e., opioids prescription pain relievers, heroin) was five times higher than in 1999. Between 2000 and 2016

more than 600,000 people died from drug overdoses. On average, 115

Americans die every day from an opioid overdose (CDC, 2017; NCHS, 2017).

The surge in opioid overdose deaths has led to a concurrent increased

need for health interventions such as Medication-Assisted Treatment (MAT).

There is an overwhelming need to treat opioid use disorder with MAT (Lopez,

2017). Medication Assisted Treatment is included in opioid treatment programs

(OTPs) and combines medications with behavioral therapy to treat substance

use disorders (Substance Abuse and Mental Health Services Administration,

2015). Medicated-Assisted Treatment (MAT) is the use of FDA approved

medications, in combination with counseling and behavioral therapies, to provide

a "whole-patient" approach to the treatment of substance use disorders

(SAMSHA, 2015). As previously stated by Volkow (2014), drug addiction is a

disease that needs medical treatment. According to the National Institute on Drug

Addiction, like other chronic diseases such as heart disease or asthma, drug

addiction has no cure, but addiction can be managed successfully (NIDA, 2018).

Treatment facilities must be prepared to provide medical attention to

people addicted to heroin or other opioids to stabilize their lives and reduce their

illicit drug use (NIDA, 2018). Potential patients cannot receive help if treatment is

not immediately available or readily accessible. As with other chronic diseases,

the earlier treatment is offered in the disease process the greater the likelihood of

positive outcomes (NIDA, 2018). A comprehensive understanding of the

addiction problem, as well as major improvements in both prevention and treatment, is necessary to be able to fight this epidemic (Dupont, 2018).

Significant access barriers to opioid treatment programs (OTPs) (i.e., medication assisted treatment) include waitlists to enter drug treatment, limited geographic and insurance coverage. Another perceived barrier is patients are required to receive methadone at OTPs each day (Gryczynski et al., 2011; Andrews et al., 2013; Rosenblum et al., 2011; Sigmon, 2014). A limited number of physicians seek a waiver from the Drug Addiction Treatment Act (DATA") (Jones, Campopiano, Baldwin, McCance-Katz, 2015). Many physicians that have obtained a DATA waiver do not use buprenorphine a FDA approved medication to treat the abuse of opioids (Jones, Campopiano, Baldwin, McCance-Katz, 2015). Studies have found that approximately (44.0%) to (66.0%) of DATA-waived physicians prescribe buprenorphine; of these prescribers, the majority do not prescribe to maximum dosage limit" (Hutchinson, Catlin, Andrilla, Baldwin, Rosenblatt, 2014). Also, best outcomes occur with longer durations of treatment (NIDA, 2018). The amount of time an opioid user is in a treatment program can affect treatment outcome (NIDA, 2018). Recovery from drug addiction is a long-term process. However, contemporary treatment for addiction prioritize time-limited settings without adequate follow-up (Dupont, Compton & McLellan, 2015). The average time for participating in residential treatment is 30 to 90 days. Outpatient treatment usually requires a participant to attend a minimum of 10 to 12 weeks 6 hours weekly of treatment. Intensive outpatient treatment may require participants to attend an average of 20 weeks 6 to 10 hours per week

(McCarty et al., 2014). This is important to the recovery process and aid participants in separation from their using environment.

Other barriers that contribute to decreased availability and the use of medication-assisted treatment (MAT) include an insufficient number of trained providers, cynicism, paucity of trained prescribers, negative attitudes, and misconstruing the purpose of addiction medications (Volkow et al., 2014). A common misconception that leads to concerns about treatment for opioid use is that it substitutes one drug for another (SAMHSA, 2015). This affects the availability of opioid treatment programs (OTPs) for OUD intervention. In fact, opioid medications used for treating opioid use disorders provides relief from physical withdrawals and psychological cravings that has created a chemical change in the body. (SAMSHA, 2015). Opioid treatment programs (OTPs) are safe environments for dispensing the adequate amount of a controlled medication necessary to overcome the effects of an abused opioid. Research has shown that medications used for the treatment of opioid use disorders dispensed at the proper dosage, does not have a negative effect on an individual's intellect, mental and physical abilities, or employability (SAMSHA, 2015).

Purpose Statement

The purpose of this study is to examine the effect of substance abuse or mental health treatment in the past 12 months had on those who reported, the

amount of days of current opioid use? The research study could lead to effective intervention strategies to address the ongoing opioid epidemic.

Research Question

Among those who reported recent opioid use, what effect does having received substance abuse or mental health treatment in the past 12 months have on the amount of current opioid use?

In these analyses, I controlled for the effects of age, gender, race/ethnicity, health insurance, and employment.

Research Hypothesis

When controlling for age, gender, race/ethnicity, health insurance, and employment, those who received substance abuse treatment and mental health treatment in the past 12 months had more days of current opioid use than those that have not received substance abuse treatment and mental health treatment in the past 12 months.

Definitions of Study Related Terms

According to the National Survey on Drug Use and Health (NSDUH) 2016, the following are the definitions are included in the survey.

1. Addiction is "the maladaptive pattern of substance use leading to clinically significant impairment" (World Health Organization WHO, 1992).

2. Buprenorphine or Subutex is "a prescription drug used in medication-assisted treatment (MAT) to help people reduce or quit their use of heroin or other opiates, such as pain relievers like morphine" (SAMHSA, 2015).

3. Cognitive-behavioral therapy (CBT) is "a time-sensitive, structured, present-oriented psychotherapy directed toward solving current problems and teaching clients skills to modify dysfunctional thinking and behavior" ("What is Cognitive Behavior Therapy | Beck Institute," n.d.).

4. Counseling is the provision of professional assistance and guidance in resolving personal or psychological problems (Oxford University Pres," n.d.).

5. Current means one to thirty days (1-30 days) for this research study.

6. Ecological Perspective "emphasizes the interaction between, and interdependence of, factors within and across all levels of a health problem. It highlights people's interactions with their physical and sociocultural environments" (Glanz, and Rimer, 2005).

7. DATA 2000 Waiver is "a permit qualified physicians to obtain a waiver from the separate registration requirements of the Narcotic Addict Treatment Act to treat opioid addiction with Schedule III, IV, and V opioid medications or combinations of such medications that have been specifically approved by the Food and Drug Administration" (Drug Enforcement Administration DEA, 2016b).

8. <u>Drug abuse or addiction</u> is "the dependence on a legal or illegal drug or medication; a primary, chronic disease of brain reward, motivation, memory, and related circuitry" (American Society of Addiction Medicine ASAM, 2011).

9. <u>Drug misuse</u> is "the use of prescription drugs without a prescription or in a manner other than as directed by a doctor, including use without a prescription of one's own; use in greater amounts, more often, or longer than told to take a drug; or use in any other way not directed by a doctor" (Centers for Disease Control and Prevention CDC, 2017).

10. <u>Drug treatment (rehabilitation)</u> is "the process of medical or psychotherapeutic treatment for dependency on psychoactive substances such as alcohol, prescription drugs, and street drugs such as marijuana, cocaine, heroin or amphetamines" (National Institute on Drug Abuse NIDA , 2018).

11. <u>Heroin</u> is an illegal, highly addictive opioid drug processed from morphine (NIDA, 2018).

12. <u>Medicaid</u> is "a jointly funded, Federal-State health insurance program for low-income and needy people. It covers children, the aged, blind, and/or disabled and other people who are eligible to receive federally assisted income maintenance payments" ("Social Security Administration," n.d.)

13. Medication-assisted treatment (MAT) is "treatment for opioid use disorder combining the use of medications (methadone, buprenorphine, or naltrexone) with counseling and behavioral therapies" (Connery, 2015).

14. Methadone is "a long-acting synthetic opioid agonist medication that can prevent withdrawal symptoms and reduce craving in opioid-addicted individuals. It can also block the effects of illicit opioids" (NIDA, 2018).

15. Morphine is "a drug used to treat moderate to severe pain. It binds to opioid receptors in the central nervous system and some other tissues. Morphine sulfate is made from opium. It is a type of opiate and a type of analgesic agent" ("National Cancer Institute NCI,"n.d.)

16. Mu opioid receptors (MOR) "mediate positive reinforcement following direct (morphine) or indirect (alcohol, cannabinoids, nicotine) activation" (Pasternak & Pan, 2013).

17. Naloxone is "a prescription drug that can reverse the effects of opioid overdose and can be life-saving if administered in time. The drug is sold under the brand name Narcan or Evzio" (CDC, 2017).

18. Opioid is "a natural or synthetic chemical that interact with opioid receptors on nerve cells in the body and brain and reduce the intensity of pain signals and feelings of pain. This class of drugs that include the illegal drug heroin, synthetic opioids such as fentanyl, and pain medications available legally by prescription, such as oxycodone,

hydrocodone, codeine, morphine, and many others. Opioid pain

medications are generally safe when taken for a short time and as

prescribed by a doctor, but because they produce euphoria in addition to

pain relief, they can be misused" (CDC, 2017).

19. Opioid use disorder (OUD) is "a problematic pattern of opioid use leading

to clinically significant impairment or distress according to the DSM-5"

("Centers for Disease Control and Prevention," n.d.)

20. Opioid treatment programs (OTPs) "provide approved medication-assisted

treatment (MAT) for people diagnosed with an opioid-use disorder"

(SAMSHA, 2015).

21. Overdose is "an injury to the body (poisoning) that happens when a drug

is taken in excessive amounts. An overdose can be fatal or nonfatal"

(CDC, 2017).

22. Prescription opioids are "medications prescribed by doctors to treat

moderate to severe pain but can also have serious risks and side effects"

(CDC, 2017).

23. Posttraumatic stress disorder (PTSD) is "a psychiatric disorder that can

occur in people who have experienced or witnessed a traumatic event

such as a natural disaster, a serious accident, a terrorist act, war/combat,

rape or other violent personal assault" ("American Psychiatric

Association," n.d.).

24. <u>Stigma</u> is "a mark of disgrace associated with a particular circumstance, quality, or person" (Olsen & Sharfstein, 2014).

25. <u>Suboxone</u> is "a prescription medicine that contains the active ingredients buprenorphine and naloxone. It is used to treat adults who are dependent on (addicted to) opioids (either prescription or illegal)" ("What is SUBOXONE Film?," n.d.).

CHAPTER TWO: REVIEW OF LITERATURE

Introduction and Purpose of the Study

The purpose of this study is to examine the effect of substance abuse treatment and/or mental health treatment on days of current opiate use when controlling for age, gender, race/ethnicity, health insurance, and employment. According to Jones et al. (2015), there is a greater demand than availability for opioid treatment program (OTP) facilities for drug treatment or counseling in most states. Therefore, increasing access and the number of drug treatment or counseling facilities for opioid abuse could help decrease the amount of days of current opioid use and gaps in treatment (Jones, et al., 2015).

The review of the literature is intended to provide relevant background information concerning the proposed study. Demographic information concerning drug treatment or counseling options are discussed. In addition, information relating to opioid use, alcohol, health insurance access, underlying mental health issues, race/ethnicity, gender, age, employment difference and applicable theoretical frameworks for the study are also discussed.

Prevalence of Opioid Use

Two million people are addicted to opioids in the United States (NIDA, 2014). Approximately 886,000 out of the two million are addicted to heroin (DHHS, 2016). According to the Center for Disease Control and Prevention (2015), the number of overdose deaths from prescription opioids remained

relatively stable between 2011 and 2015. However, overdose deaths from illicit opioids (e.g., heroin and synthetic opioids such as fentanyl) continued to increase between 2016 and 2017. Related in part to a growing number of people with opioid use disorder (OUD) in connection with prescription opioids (HHS, 2018).

Poisoning, driven largely by opioids, became the leading cause of death due to injury in the United States in 2008, surpassing motor vehicle crashes (Warner, Chen, Makuc, Anderson, & Minino, 2011). Heroin overdose is a major contributor to the excess mortality of heroin addicts. Opioids such as heroine are respiratory depressants and can lead to respiratory failure (Jolley, Bell, Rafferty, Moxham, & Strang, 2015). In 2016, there were more than 63,600 drug overdose deaths in the United States (Hedegaard, Warner, & Minino, 2017). The age-adjusted rate of drug overdose deaths in 2016 (19.8 per 100,000) was 21% higher than the rate in 2015 (16.3 per 100,000) (Hedegaard, Warner, & Minino, 2017).

Jones et al. (2015) found a significant and continuous increase in heroin use in the United States in recent years among both men and women in many age groups across all income levels. The CDC notes that some of the greatest increases have occurred in demographic groups with historically low rates of heroin use, including women, the privately insured, and people with higher incomes (CDC, 2017). In addition, heroin use among people aged 18 to 25 more than doubled in the past decade (Jones et al., 2015).

Most of the current users now comprise white men and women in their late 20s, living outside of large urban areas (Bonnie, Ford, & Phillips, 2017). Many users were introduced to opioids through prescription drugs then progressed to heroin. This was due to lower cost and greater availability of heroin. Although, whites and non-whites were equally represented, nearly (90%) of respondents who began use in the last decade were white (Cicero et al., 2014). Many opioid users became dependent on the nonmedical use of prescription opioids before they began using heroin. The National Institute on Drug Abuse (NIDA) noted increasing numbers of prescription opioid-dependent people turning to heroin as prescription opioids became harder to misuse (Volkow, 2014) due to prescription monitoring programs and tamper-resistant opioid formulations (Netherland & Hansen, 2017).

Becker et al., (2008) found that heroin users were 3.9 times as likely to report nonmedical use of opioids in the previous year, and 2.9 times as likely to meet the criteria for abuse or dependence on opioids, as those individuals who did not use heroin. Grau et al. (2007) found that using multiple opioid prescription pain relievers for nonmedical purposes was associated with transitioning to heroin. A similar article by Muhuri et al. (2013) found that the incidence of heroin use among people who reported prior nonmedical use of prescription opioids was 19 times as high as the incidence among persons who reported no previous nonmedical use. Also, nonmedical use of opioids pain relievers was less stigmatized than heroin use; however, opioid abusers continue to transition to heroin regardless of the stigma associated with the drug.

Researchers Hatcher, Mendoza, & Hansen, (2018) conducted a study of the differences in patient's experiences of stigma and of social support based on their treatment settings (e.g., inpatient versus outpatient substance dependence clinics). Their results indicate that patients in inpatient treatment can mask their addiction in this type of treatment setting. This helps to minimize their exposure to stigma (Hatcher, Mendoza, & Hansen, 2018).

Types of Substance Abuse Treatment

Detoxification from opioid abuse provides approved opioid antagonistic medications, along with counseling, and other methods for patient stability while withdrawal takes place from an abused opioid in a controlled environment. (CSAT, 2005, Chapter 1).

Prescribed medications can help control cravings and manage withdrawal. They can also help people manage recovery from opioid and alcohol use disorders over long periods of time. The decision of how long to take medication is a personal choice that can be made with a support team (doctor, counselor, peer support, family, or friends) (SAMHSA, 2016).

Treatment. Treatment programs are structured, often intensive, time-limited services for dealing with addiction. Programs consist of outpatient (i.e., daily or weekly), residential in-patient, or hospital-based in-patient treatment, and most programs help individuals learn about addiction and becoming productive members of society. Although the Substance Abuse and Mental Health Services Administration (SAMHSA) says detoxification alone is not considered treatment

(SAMHSA, 2016), some programs include detoxification and follow-up counseling or support groups.

Treatment usually includes an assessment that allows the staff to understand the severity of the problem and help the participant create an effective personal treatment plan. It helps participants recognize that they have created their own problems with negative thought patterns and belief systems. Participating in treatment also helps identify high-risk situations and practice new ways of thinking and acting. Treatment programs may specialize in different kinds of addictions such as marijuana, opioids, alcohol, or gambling. There are programs for men, women, co-ed, adolescents, and other groups. Some treatment programs last for a few weeks; others last for many months. Out-patient programs have the benefit of offering treatment services in the community. They may offer MAT, as well as counseling and other support services (i.e., referrals to recovery homes, half-way houses, employment opportunities, etc.) (SAMHSA, 2016).

In-patient treatment. Residential programs combine housing and treatment (i.e., individual or group counseling) services in a living situation where participant peers support each other to stay in recovery. Participants are seen weekly or as needed by a physician and nurse. Hospital-based programs may offer both in-patient and out-patient programs that combine health care and addiction treatment services for people with medical conditions.

Out-patient treatment. Out-patient treatment is offered in levels of treatment. Intensive day treatment is the 1st level of out-patient treatment and meets 4-5 days per week. It is similar to residential in-patient treatment and varies in effectiveness and treatment service (NIDA, 2018). Low-intensity treatment is the 2nd level of treatment and meets 2-3 days per week. Low-intensity outpatient offers drug education with more leniency than intensive programs (NIDA, 2018). In many out-patient programs, group counseling can be a major component. Out-patient treatment costs less than residential or inpatient treatment and often is more suitable for people with jobs or extensive social support need (NIDA, 2018). Some out-patient programs are also designed to treat patients with medical or other mental health problems in addition to their drug disorders (NIDA, 2018).

Office-based opioid treatment (OBOT). Physicians who wish to prescribe *buprenorphine* mono-product or combination *buprenorphine/naloxone* for the treatment of opioid use disorder or withdrawal management must qualify for a waiver under DATA 2000. Physicians with approved DATA 2000 waivers are not confined to the office-based setting and may treat opioid addiction with approved *buprenorphine* products in any out-patient practice setting which is medically approved by SAMHSA (Kampman, & Jarvis, 2015).

Research shows that generally the longer people remain involved with treatment and continued care, the more likely they are to benefit, and people specially in medication-assisted treatment for opioid use disorder who continue

with long-term treatment have better results. Stopping medication too early

increases the risk of returning to opioid use. People in long-term maintenance

treatment for opioid use disorder should be periodically assessed for individual

ongoing medication needs (SAMHSA, 2016).

Support. Recovery supports are the people, places, and things that help

substance abusers stop using drugs and alcohol and begin a life in recovery.

Successful recovery depends on finding and using the supports that work best

for the patient and can include transitional housing, employment services,

medical care, mental health treatment, childcare, transportation, and other types

of services and resources that allow people to move forward in recovery.

Sometimes, recovery support includes finding a faith-based group that inspires

you, getting involved in sports and leisure activities, or even giving back to the

community (SAMHSA, 2016).

Recovery community. A growing number of organizations, led by people

in recovery, support all pathways to recovery, even when medication is a part of

the journey. Some groups, such as Methadone Anonymous, are specifically

geared toward people in medication-assisted recovery. Recovery Community

Centers offer behavioral counseling, peer support, and opportunities to socialize

with others in recovery (SAMHSA, 2016).

Behavioral Counseling for Opioid Use

The combination of FDA-approved medications with counseling or

cognitive behavior therapy to treat opioid use disorder (OUD) is a dual approach

used by most providers (SAMSHA, 2015). *Methadone*, *buprenorphine*, and

naltrexone are the medications approved for MAT treatment that is available in

different forms (i.e., pills and intravenous) that includes time-released doses

(SAMSHA, 2015). The medications are for relieving symptoms from the

withdrawal of opioids by blocking the euphoric aspect of the abused drug

(SAMSHA, 2015). The healthcare providers develop treatment plans with patient

input, specifically centered around the patient's opioid addiction to address

behaviors that may have contributed to their addiction (SAMSHA, 2015). This

method of treatment for OUD has obtained supported from "medical and

behavioral health groups, including the American Society of Addiction Medicine

and the National Council for Behavioral Health, patient advocate groups, and

federal entities including the White House Office of National Drug Control Policy

and the U.S. Surgeon General" (SAMSHA, 2015).

Psychosocial (involving both psychological and social aspects) treatment

is the behavioral health method recommended for opioid use disorder therapy

along with approved medications for MAT treatment. Patients receiving

psychosocial treatment have better outcomes than patients receiving

medications only (Dutra et al., 2008). There are specific medications specifically

designed to treat the withdrawal of opioid abuse. Methadone, buprenorphine, and

naltrexone are the only FDA-approved medications used to treat OUD. Under

federal regulations for methadone treatment, the drug must be administered daily

in a certified opioid treatment program (OTP) (ASAM, 2015). In accordance with

federal law, buprenorphine may be prescribed on a weekly or monthly basis for

at-home use, but clinicians must apply for waivers (i.e., DATA 2000 Waived

Physician) to prescribe these medications (DEA, 2016b; ASAM, 2015). In

contrast, naltrexone can be prescribed by any clinician authorized to dispense

medications.

Through varying types of substance abuse treatments, users can find

help. Opioid users that participate in both medication and psychosocial therapy

experience positive mental and physical change (ASAM, 2015). Alcohol abuse

and the increase in heroin use in this country has created a need for more

addiction treatment programs. The current opioid epidemic shows it is of

paramount importance for additional opioid treatment facilities to make strides in

reducing the opioid crisis. Lack of healthcare insurance impedes access to

medication and treatment programs is a major obstacle for people in need of help

seeking treatment. MAT treatment has different mechanisms of action. The drug

effects—in addition to patient-specific factors, such as response to past

treatment guide therapy selection (DEA, 2016b; ASAM, 2015).

Access to Health Insurance for Drug Treatment

Policy and regulatory barriers are a major concern regarding access to

Medication-Assisted Treatment (MAT) facilities. A recent report from the

American Society of Addiction Medicine (2015) describing public and private

insurance coverage for MAT highlights several policy-related obstacles that

warrant closer scrutiny. These barriers include utilization-management

techniques such as limits on dosages prescribed, annual or lifetime medication

limits, initial authorization and reauthorization requirements, minimal counseling coverage, and "fail first" criteria requiring that other therapies be attempted first (Rinaldo & Rinaldo, 2013). These are barriers that the state and federal government allow health insurance providers to implement which prevent easy access by participants to MAT facilities (Rinaldo & Rinaldo, 2013).

Another research study has shown that private insurance policies are inconsistent with the duration and number of episodes of treatment they will support for MAT coverage. Before patients are approved for insurance coverage to attend a MAT facility they must first experience a relapse (Legal Action Center, 2015). Several private insurance companies exclude coverage for methadone maintenance from their health plans, although it is proven to be the most effective form of treatment for people with opioid use disorder (OUD) (Legal Action Center, 2015).

Volkow et al. (2014) indicates that Medicaid covers *buprenorphine* and *methadone* in every state; however, some Medicaid programs or their managed-care organizations apply the utilization-management policies described above. Medicaid is offers enrolled low-income persons and family's coverage of defined acute, rehabilitative, and/or long-term health care services and supports, including the state option to provide addiction treatment (Volkow et al., 2014). Most states have opted to provide addiction treatments under Medicaid. However, typically those addiction benefits have not been updated to reflect

current science, including medication-assisted treatment (MAT) using one or more of the opioid dependence medications (Rinaldo & Rinaldo, 2013).

One of the perceived barriers to Medicaid treatment is some states place limits on the length of treatment with *buprenorphine-naloxone*. Once this occurs, prior authorization is required for continued treatment (Office of Women's Health, 2017). Many states require evidence from treatment providers that behavioral therapy is incorporated into the patient's treatment. Although behavioral therapy is a component of MAT, a concern is that documentation can be a burden and become another barrier to accessing medications (The Center for Medicaid and Chip Services et al., 2014).

A survey conducted by the American Society of Addiction Medicine (ASAM) on Medicaid indicates that there is a lack of Medicaid eligible enrolled addiction medicine prescribers and treatment programs offering MAT. In one of the southern states in the United States, there is only a single methadone program eligible for state Medicaid reimbursement (Rinaldo & Rinaldo, 2013). There is limited availability of MAT programs for opioid-dependent Medicaid enrollees, meaning that Medicaid eligible enrolled practitioners and programs are scarce. This leads to long commutes and/or Medicaid-paid transportation, creating a substantial rise in cost for many states (Rinaldo & Rinaldo, 2013). . Some states layout and require adherence to their own Medicaid policies in request for proposals (RFP's) and contracts. Others allow or require clinical discretion and some commonalities in coverage: formulary lists, prior

authorization, reauthorization and other utilization of quality management criteria procedures. Access to care can be limited to in-network providers (ASAM, 2015, p. 15).

Most commercial insurance plans also cover some opioid-addiction medications most commonly *buprenorphine*. Coverage is generally limited by similar policies that govern public and private insurers (i.e., utilization management policies). Utilization management policies limit access to pharmacotherapies approved by the FDA to treat opioid addiction

A few private insurance plans provide coverage for the depot injection formulation of *naltrexone* (i.e., effective and relatively well-tolerated medication for relapse prevention in heroin addicts) (Xuyi et al., 2014). A commercial health insurance plan may or may not cover all parts of *buprenorphine* medication. Several factors determine coverage including: medical necessity, covered medications, a co-payment requirement, and the plan's approval of *buprenorphine* (SAMHSA, 2015).

Implementation of the Affordable Care Act (ACA) in 2014 increased access to care for many Americans, including persons with addiction. The expansion builds on the Mental Health Parity and Addiction Equity Act (MHPAEA). It requires insurance plans that offer coverage for mental health or substance use disorders (SUD) to provide the same level of benefits of general medical treatment. The ACA significantly extends the reach of the parity law's requirements by, ensuring that more Americans have coverage for mental health and substance-use

disorders and that coverage complies with the federal parity requirements
(Volkow et al., 2014). Despite implementation of the ACA, numerous health plans
do not cover some of the medications included in medication-assisted treatment
(MAT) due to cost and length of treatment issues (Volkow et al., 2014).
According to the Substance Abuse and Mental Health Services Administration
(SAMHSA), the MHPAEA does not require insurance plans to offer coverage for
SUD, nor does it require coverage for specific treatments or services for SUD
(SAMHSA, 2016). The type of treatment for opioid use varies according to the
user's current use and history of any underlying health conditions including
mental health.

Mental Health Difficulties as They Related to Opioid Use

The 2016 National Survey on Drug Use and Health (NSDUH) views
mental health and substance use disorders (SUD) as coexisting conditions. This
view stems from the fact that many people with SUD have mental health issues
and people with mental health disorders have issues with substance abuse.
Research indicates that as many as 6 out 10 people with this illicit SUD also
suffer from another mental illness. Either condition becomes more difficult to treat
successfully in isolation because of the co-occurring condition is existing (NIDA,
2018). Treating both illicit SUD and AMI simultaneously in an integrated method
would provide the best treatment approach for patients (NIDA, 2018). Regardless
to their interconnection, these two disorders often go untreated; only a small
group of people receive treatment services (SAMHSA, 2017). The NSDUH

indicates that (18.3%) of adults aged 18 years old or older had any mental illness

(AMI) in the past year, and (7.8%) had a SUD during the same period (SAMHSA,

2017; CBHSQ, 2017).

A diagnosis of co-occurring disorders (COD) occurs when at least one

disorder of each type can be established independent from the other one and is

not simply a cluster of symptoms resulting from the disorder (NSDUH, 2015).

Opioid abusers may be treated for their substance abuse issue without mental

health intervention. They often move from one type of treatment (i.e., SUD or

AMI) to another, as symptoms of one disorder becomes predominant (NSDUH,

2015). When people with OUD and mental illness enter treatment both disorders

should be addressed, including the use of medications (i.e., MAT) as an

appropriate form of treatment (U.S. Department of Health and Human Services;

National Institutes of Health; National Institute of Mental Health, 2012). There

have been developments in the treatment of co-occurring disorders because

substance abuse treatment facilities are seeing more patients with mental health

issues enter treatment.

Treatment facilities are being pressured to identify and treat the multiple

and co-occurring mental disorders that characterize a substantial proportion of

clients entering their clinics. Whether these expectations are met directly through

on-site services or through the establishment of linkages to the mental health

services system depends on organizational factors. These factors are often

beyond the control of the individual counselor and the substance abuse

treatment program. Resources both limit and permit the training and supervision of current staff, the hiring of specialized staff; whether the staff is available in a community; and whether mental health services are readily accessible in a community will help to determine the response to the substance abuse treatment program. All these methods can meet the mental health needs of the client (Flynn, & Brown, 2008, pp. 36-47).

In a study of 500 consecutive patients that reported chronic pain as the root cause and risk factor for opioid-related poisoning deaths, researchers found that (12%) of patients with depression abused drugs, and (5%) of patients without depression did not abuse drugs (Webster et al., 2011). According to researchers Saffier et al. (2007), The Addiction Severity Index (ASI) was used to assess comorbid conditions in 908 patients on opioid treatment for chronic pain. It was found that patients with chronic pain have higher rates of psychiatric comorbidity, (.27%) reported lifetime depression, anxiety, or suicidal thoughts or attempts than the general population which was (.3%) (2007).

Gender differences may also impact mental health as it relates to opioid use. Other risk factors for nonmedical use of prescription opioid among women compared to men are psychological and emotional distress (OWH, 2017). Researchers (Smith, Homish, Leonard, & Cornelius, 2012), indicate that intimate partner violence victimization, among women, have an association with opioid use disorders (OUD's). When women are under the influence of opioids they may become more susceptible to intimate partner violation, and studies have shown

that physical and sexual trauma followed by post-traumatic-stress-disorder (PTSD) is prevalent in drug misusing women compared to in drug misusing men (United States Department of Health and Human Services (USDHHS), 2012; National Institute of Health (NIH), 2012; National Institute of Mental Health (NIMH), 2012).

Trauma and opioid use. A multitude of forms of trauma are associated with substance abuse disorder (SUD). Several researchers have studied the relationship between trauma and SUD, and they have associated first traumatic experiences with post-traumatic stress syndrome (PTSD) and adverse childhood experience (ACE). The following are research studies focused on trauma as it relates to SUD.

Researchers Lawson et al., (2014) conducted a study on childhood and adult trauma. The study researched the history of (i.e., general, sexual, physical, and emotional) trauma among people with substance use disorder (SUD) using The Life Stressor Checklist-Revised (LSC-R). There were 201 participants in the study (prescription opioid (n=41), cocaine (n=73) and nicotine (n=87) that completed the LSC-R (2014). The study results indicated that all three groups experienced elevated levels of trauma exposure, with (96.5%) of the entire sample experiencing at least one traumatic event in their lifetime. The prescription opioid group experienced a greater number of general and total traumas than the nicotine group and reported a younger age of first traumatic event than the cocaine group and was significantly more likely to report childhood

traumatic events than both the cocaine and nicotine groups. No group reported differences in the number of emotional, physical, or sexual traumas were revealed (Lawson et al., 2014).

Lawson et al. (2014) says there is a significance connection between traumatic events and opioid use, especially those in childhood. People in substance abuse and mental health treatment must address childhood and traumatic life events during the recovery process. Many people with SUD have experience some form of traumatic event (i.e., mental or physical abuse) in their lifetime; however, when participating in substance abuse treatment underlying mental health issues are not always addressed. Lawson et al., findings for the opioid group indicated the younger age group for experiencing first time traumatic events. Whether, the traumatic events were mental or physical research has found opioid users to have first time traumatic issues at an early age. Substance use disorders and mental health illness involve changes in thinking, mood, and behavior changes. Medicating with mind mood-altering substance is a coping mechanism for handling traumatic events without the use of professionals. In a study conducted by researchers Sansone, Whitecar, and Widerman (2009), 113 treatment-seeking opioid-dependent participants in outpatients seeking buprenorphine treatment were sampled to obtain the history of traumatic life events. The majority (80.5%) of the participants reported a history of childhood sexual, physical, or emotional abuse, physical neglect, or violent trauma (2009).

The above research study of treatment-seeking opioid-dependent participants had significant adverse childhood experiences (ACE) that could have contributed to their opioid use. Statistically significant results in the study for having received substance abuse treatment and mental health treatment in the past 12 months on the amount of days of current opioid use indicated a need for more substance abuse treatment and mental health treatment facilities to address coexisting or co-occurring disorders.

The traditional view on the link between substance dependence and PTSD is that individual's first experience trauma, and in an effort to self-medicate and treat their symptoms, they begin using drugs, and then go on to develop addiction (Columbus, 2018). Another study was conducted on opioid abusers and post-traumatic stress disorder (PTSD) by researchers using a national dataset that indicated people with opioid use disorder (i.e., heroin) had higher rates (33.2%) of PTSD from the general population of people with SUDs (Mills, Teesson, Ross, and Peters, 2006). The research study for receiving substance abuse treatment and mental health treatment in the past 12 months on the amount of days of current opioid use indicated mental health and opioid use were not significant. The research results were statistically significant for receiving substance abuse treatment and mental health treatment on the amount of days of opioid use. Therefore, having facilities available for opioid users with PTSD is important for those suffering with these issues.

Adverse childhood experiences (ACEs) are stressful or traumatic events, including abuse and neglect. They may also include household dysfunction such as witnessing domestic violence or growing up with family members who have substance use disorders (Bradbury, 2019).

The Centers for Disease Control and Prevention (CDC) states that Adverse Childhood Experiences (ACE) is associated with risky health behaviors, chronic health conditions, low life potential, and early death. As the number of ACEs increases, so does the risk for these outcomes. The goal is to prevent these health and social consequences before the occur (National Center for Injury Prevention and Control, Division of Violence Prevention, 2016). These ties from trauma to opioid use serve as telling indicators of how treatment might best be considered.

Employment and Opioid Use

Employees that obtain work-related injuries with workers compensation (WC) and short-term disability (STD) claims are usually prescribed opioids (Johnston et. al., 2016). The research study evaluated 107,975 employees with treated with opioid pain relievers with an injury-related WC or STD claim. Employees diagnosed with opioid abuse had more prescriptions filled and their adjusted total healthcare cost was much greater than employees without opioid abuse were (WC: (13.4%) vs. (4.5%), $p < 0.001$; $18,073 vs. $8,470, $p < 0.001$; STD: 13.7 vs. 4.5, $p < 0.001$; $25,693 vs. $14,939, $p < 0.001$) (Johnston et. al., 2016).

County unemployment rates and opioid abuse death rates have drastically increased, and a clear connection bonds the two (Hollingsworth, Ruhm, and Simon, 2017). A new study reports unemployment might be one of the factors behind that dramatic rise in opioid abuse. The study results find as the unemployment rate increases by one percentage point in a given county, the opioid-death-rate rises by (3.6%), and emergency-room visits rise by (7.0%) (Khazan, 2017).

Rather than more people being injured when jobs are scarce, researchers indicate that the increased use of painkillers is a "physical manifestation of mental-health problems that have long been known to rise during periods of economic decline" (Khazan, 2017). Depression and pain are twin agonies, as depression makes people more sensitive to pain and opioids have been used to help relieve depressive symptoms (Khazan, 2017).

Poverty, unemployment rates, and the employment-to-population ratio are highly correlated with the prevalence of prescription opioids and with substance use measures. The counties with the worst economic conditions are more likely to have higher rates of opioid prescriptions, opioid-related hospitalizations, and drug overdose deaths (Ghertner and Groves, 2018). A current research study conducted by Alan B. Krueger of Princeton University reported that nearly half of "prime age" men not in the labor force take pain medication daily (Krueger, 2017). Another researcher indicated in a study that unemployed people are more likely to use illegal drugs than people that work full-time (Khazan, 2017).

A study was conducted by several government agencies U.S. Census Bureau, Bureau of Labor Statistics, Drug Enforcement Administration, Centers for Medicare & Medicaid Services, Centers for Disease Control and Prevention, and the State Inpatient Databases and State Emergency Department (2016) that analyzing poverty and unemployment rates as it relates to the opioid epidemic. Counties with higher poverty and unemployment rates generally had higher rates of retail opioid sales and Medicare opioid prescriptions, as well as drug overdose deaths and opioid-related hospitalizations (Ghertner and Groves, 2018). The study was analyzed using the Geospatial Analysis also known as Spatial Dependency, Moran's I, a metric of spatial clustering, study results was 0.58 (p < 0.001) for poverty and was 0.61 (p < 0.001) for unemployment (Ghertner and Groves, 2018).

There is a strong statistical link between county poverty and unemployment rates and measures of the opioid crisis (Ghertner and Groves, 2018). Poverty rates were lower in the Midwestern states at (13.2%) in 2016, than in other areas of the country combined at (17.3%). Poverty and unemployment rates showed a clustered in Appalachia, the South, and the West. The poverty rates were high in some areas: while the average poverty rate was (15.8%) in 2016, over 250 counties in the U.S. had a poverty rate greater than (25.0%). Poverty rates were much lower in the Midwestern states than in other areas. In fact, the average poverty rate for a Midwestern county was (13.2%) in 2016, vs (17.3%) for all other areas combined. Additionally, poverty and unemployment rates were particularly pronounced and clustered in Appalachia,

the South, and the West. Moreover, the poverty rates were high in some areas: while the average poverty rate was (15.8%) in 2016, over 250 counties in the U.S. had a poverty rate greater than (25.0%) percent (Ghertner and Groves, 2018). Research has shown that employment is a key factor to consider when researching substance abuse treatment and opioid use as well as gender and opioid abuse.

Gender and Opioid Use

According to combined 2013 and 2014 NSDUH data, an annual average of 5.7 million men and 5.0 million women misused prescription pain relievers in the past year (Lipari & Hughes, 2017). A report from The Centers for Disease Control and Prevention states that chronic pain is experienced more by women than men (Dahlhamer et al., 2018). Research shows that women use opioid prescription pain relievers in higher doses for longer periods of time than men (NIDA, 2015). From 1999 to 2015, the rate of deaths from prescription opioid overdoses increased (471.0%) among women, in comparison to an increase of (218.0%) among men (CDC, 2017). Heroin use among women surpassed prescription opioid misuse for both genders between 2012 and 2016 (Martins et al., 2017). Research found from 1960 to 2010 there was a (17.0%) to (51.0%) increase in heroin addiction among women. (Cicero et al., 2014). Chronic pain is a contributing factor for opioid abuse among both genders although women are more susceptible.

Women are more likely to become physically dependent on opioid pain medication quicker than men, a phenomenon known as "telescoping." Telescoping refers to the progression of time from first use of an addictive substance to physical dependence on that substance (SAMHSA, 2015). Body fat percentage, metabolic rate, and hormonal fluctuation are basic physiological differences that more than likely lead to telescoping (OWH, 2017).

According to the Centers for Substance Abuse Treatment (2009). Women's risks for substance use disorders (SUD) are best understood in the context in which the influences of gender, race and ethnicity, culture, education, economic status, age, geographic location, sexual orientation, and other factors converge (Centers for Substance Abuse Treatment, 2009). To develop and implement effective substance abuse treatment programs for women it is imperative to understand their specific needs. This include each demographic that are potential risk for (SUD) across different group populations (CSAT, 2009). Also, in the United States, the increase in heroin dependency among women has led to a significant number of babies born with neonatal abstinence syndrome (NAS) (i.e., neonatal withdrawal) (Patrick et al., 2015).

Neonatal abstinence syndrome. Neonatal Abstinence Syndrome (NAS) is a drug withdrawal syndrome that most commonly occurs in infants after in utero exposure to opioids; other substances have also been associated with this syndrome (Ko et al., 2017). There is a window between 48-72 hours after birth for detection of neonatal abstinence syndrome. The infant will display clinical

signs that include: central nervous system irritability (e.g., tremors),

gastrointestinal dysfunction (e.g., feeding difficulties), and temperature instability

(Ko et al., 2017).

Ko et al. (2017) study found the following:

> The central nervous system irritability includes: high-pitched, continuous
>
> crying, decreased sleep, tremors, increased muscle tone, hyperactive
>
> moro reflex, seizures, gastrointestinal dysfunction, feeding difficulties,
>
> vomiting, and loose/watery stools. The autonomic nervous system
>
> activates: sweating, fever, frequent yawning and sneezing, increased
>
> respiratory rate, and nasal stuffiness and flaring. (p. 7)

The National Institute on Drug Abuse states that maternal opioid use has

increased at an alarming rate between 2000 to 2012 (Patrick et al., 2012; Patrick

et al., 2015). The misuse of opioids during pregnancy impacts the health of the

unborn child as well (American College of Obstetricians and Gynecologist, 2017).

A report by SAMHSA shows that prenatal maternal opioid use increased from

1.19 to 5.63 per 1,000 births per year from 2000 to 2009 (SAMHSA, 2016).

Neonatal abstinence syndrome showed a five-fold increase estimating 21,732

babies were born with NAS. According to the research conducted, this is

equivalent to a baby withdrawing from opioids every 25 minutes (Patrick et al.,

2012; Patrick et al., 2015). Opioid withdrawal is difficult for adults and some of

the medical and psychological symptoms (e.g., hypertension, rapid heart rate,

severe vomiting, and diarrhea) may have complications that may be life-

threatening (NIDA, NIH, USDHHS, 2018). Infants born with NAS are at risk of experiencing hyperactivity of the central and autonomic nervous system (SAMHSA, 2016). For an infant to experience NAS from opioid withdrawal is unimaginable.

Infants born withdrawing from opioids must be carefully monitored and treated as needed. Treatment for pregnant women with OUD is *methadone* or *buprenorphine* assisted therapy. Pregnancy outcome improves with Medication-assisted treatment (MAT) which potentially reduces risky behavior associated with illicit drug use in the mother and reduces the risk of NAS for the infant (Fajemirokun-Odudeyi, Sinha, & Tutty et al., 2006; Brogly, Saia, Walley, Du, & Sebastiani, 2014).

There are clinical issues related to treating women of different racial and ethnic groups, sexual orientations, older women, and women living in rural areas (Centers for Substance Abuse Treatment (U.S.), 2009, p.p. 103-104). Although certain elements of their substance use disorders are common to all these groups (such as trauma and/or socioeconomic stresses), each group also has unique features that will further influence their engagement (i.e., cultural values, beliefs about health care, and help-seeking behavior) and successful completion of treatment (Centers for Substance Abuse Treatment (U.S.), 2009, p.p. 103-104). More research in this area of study may enhance assessment and education for treatment planning.

Race and Ethnicity and as it Relates to Opioid Use

Heroin and prescription pain relievers affect people in almost every racial and ethnic group (Martin et al., 2015). Martins et al. (2017) found that between 2002 to 2014, heroin use decreased among blacks and prescription opioid misuse increased; among white's heroin use increased and prescription opioid misuse decreased for patients entering opioid treatment programs (OTPs). The prevalence of heroin use for Hispanics decreased and prescription opioid misuse increased between 2008 and 2011 (Martins et al., 2017).

There are racial differences in receiving drug treatment or counseling. Research shows blacks and Hispanics have a higher rate of not completing substance abuse treatment except for opioids, whereas patients of Asian ethnicity completed substance abuse treatment at a higher rate than whites (Saloner & Cook, 2013). Often socioeconomic barriers in the minority population of opioid users prevent patients from completing substance abuse treatment (e.g., high social distress, weak social support, and limited economic opportunities) (Saloner & Cook, 2013). In 2013, a research study was conducted by Treatment Episodes Datasets-Discharge (TEDS-D) and Substance Abuse and Mental Health Services Administration (SAMHSA), in which they investigated outpatient services provided specifically for minority populations in urban communities due to differences in drug use patterns, the perceived need for treatment, and treatment availability between urban and rural areas for African Americans and Hispanics. Study results indicate:

Disparity in treatment episode completion for minorities, particularly

African Americans, as compared to whites, as well as the affinity of certain

racial and ethnic groups for certain problem substances, it is fair to inquire

whether observed racial and ethnic disparities in treatment episode

completion are being driven by the lower completion rates associated with

certain problem substances. For Hispanics, this indeed appears to be the

case, at least to some extent, as the disparity observed among the full

sample is driven largely by the fact that Hispanics are (75.0%) (Cohen's d

= 0.16) as likely to complete a treatment episode for heroin use as

compared to whites. (Mennis, & Stahler, 2016, pp. 30)

The majority of the patient's in inpatient treatment facilities (i.e., may or

may not treat opioid users) are white, but most patients in opioid treatment

programs (OTPs) (i.e., use medication to treat opioid users) are of ethnic descent

(i.e., African American and Hispanic). One factor in this is that the stigma of

opioid use can be harmful to patients after treatment and cause racial or ethnic

disparities for minorities. Medication-assisted treatment (MAT) for opioid use

disorder (OUD) can last for many years, decreasing the likelihood of success

(Saloner & Cook, 2013).

America has a new face of addiction: "white middle-class females" labeled

by the national press covering the opioid epidemic overdoses (Hansen, 2017).

Dallas & Balazic, (2015) also found young white females as the new face of

heroin addiction. The death rate for opioid abuse is increasing at alarming rates

for women, specifically white women. Research study shows in 1999 black

Americans of all ages were most likely to die from drug-related causes. By 2013,

white Americans were nearly twice as likely to die from drugs and related causes

as black Americans (Schrager, 2015).

Although men have a higher rate of overdose deaths, the rates are

extremely on the rise for white women (Office of Women's Health, 2017).

Prescribing rates of prescription opioids for white American women with chronic

pain contributed to the increase in deaths (OWH, 2017). Limited research

pertains to the decrease in the opioid death rate for other racial groups but an

increase for white women. A contributing factor according to researcher Schrager

(2015), middle-aged white women are more likely than minority women to receive

treatment for chronic pain with prescription opioids (Schrager, 2015). Prescriber

bias may have led to the disparity in the rate of prescribing with minorities less

likely to be prescribed opioids (Institution of Medicine, 2011).

The Centers for Disease Control and Prevention researchers found that

Medicaid recipients receiving opioid prescriptions were almost one and a half

times higher among white, non-Hispanic women ages 15 to 44, compared with

non-Hispanic black or Hispanic women (CDC, 2015). Research has shown that

American Indian or Alaska Native women have the highest risk of dying from a

prescription opioid overdose (CDC, 2013). Race and ethnicity are important

when researching drug abuse or addiction due to cultural differences and the

stigma attached to drug use, and age is an important characteristic to assess among race and ethnicity when studying drug use.

Age of Opioid Users and Mortality

The age group with the greatest past-year, nonmedical use of opioids is young adults aged 18 to 25, yet the greatest use (i.e., exposure) of prescription opioids is among adults aged 26 and older (NIDA, 2016; NIH, 2016; USDHHS, 2016). Substance Abuse and Mental Health Services Administration data indicates that most people who report prescription opioid misuse in current cohorts initiated use in their early to late 20s, which may explain why prescription opioid mortality disproportionately affects adults aged 25 to 54 (CDC, 2016). Data shows an overlap in these age-related demographics with respect to the current use of heroin and, more disturbingly, the coincident increase in overdose deaths caused by heroin and synthetic opioids other than methadone among people aged 15 and older (Rudd et al., 2016). Among persons aged 15 and over, adults aged 25 to 34, 35 to 44, and 45 to 54 had the three highest rates of drug overdose deaths in 2016 with ages 25 to 34 at around 35 per 100,000 (Hedegaard, Warner, Arialdi, 2017).

Young adults age 18 to 25 are the biggest abusers of prescription opioid pain relievers, attention deficit hyperactivity disorder (ADHD) stimulants, and anti-anxiety drugs. They indulge for numerous reasons that include attempting to experience a euphoria feeling or to study and focus better, all the while not realizing the dangerous effects of prescription drugs (NIDA, 2016). According to

the National Survey on Drug Use and Health 2017, the age group with the

greatest increase of heroin use appears to be driven largely by young adults

aged 18–25 among (NIDA, 2018).

In 2015, 4,235 youth aged 15 to 24 died from a drug-related overdose;

over half of these were attributable to opioids (McCabe et al., 2007). The health

consequences of opioid misuse have affected many people. The CDC estimates

that for every young adult overdose death, there are 119 emergency room visits

and 22 treatment admissions (Lord, Brevard, & Budman, 2011). In 2014, over

1,700 young adults died from prescription drugs. Opioids were the main

contributor to overdose deaths of any other drug, including heroin and cocaine

combined, and more people needed emergency treatment because of them

(NIDA, 2016).

A population that has been particularly affected is middle-aged adults, with

chronic and unrelenting pain. If not adequately managed, pain could be a factor

in the misuse of opioids like other populations (Farinde, 2017). The goal is to

achieve pain management without the abuse of opioids. Educating primary

prescribers that prescribe 50% of opioids to their patients is the first step in opioid

prevention. Next, patients need proper education on taking opioids and the

potential for abuse and fatal overdose (Farinde, 2017). More than 44% of opioid

overdose deaths occur in patients aged 45 to 64 (Chance, 2017). Misuse and

aberrant opioid use behaviors also may manifest differently in older adults

(Beaudoin et al., 2016; Henderson et al., 2015). A study conducted at New York

University showed that older adults have become the largest age group seeking treatment for opioid prescription pain relievers and heroin (Han et al., 2015).

The population over the age of 50 has also experienced an increase in injection drug use and admission to substance abuse treatment. There is limited information regarding the health status and functional impairments in the aging population of adults accessing opioid treatment (Han et al., 2015). The population of older adults that misuse opioids is projected to double from 2004 to 2020, from (1.2%) to (2.4%) (Administration on Aging and Substance Abuse and Mental Health Services Administration, 2012).

Opioids can help older adults keep their independence and are a key predictor for the treatment of debilitating pain that might otherwise leave individuals immobilized and homebound (Administration on Aging and Substance Abuse and Mental Health Services Administration, 2012). For the aging population, chronic pain, a highly prevalent affliction, accompanied by a significant increase in opioid use (Grey & Hall, 2016). Precautions must be taken when prescribing opioid treatment for the elderly and all other age groups because of abuse potential (Grey & Hall, 2016).

Theoretical Focuses

Ecological Approach, Cognitive Behavior Therapy (CBT), and Social Cognitive Theory (SCT) are the chosen theoretical frameworks for this research study. They are evidence-based treatment approaches for substance abuse and mental health disorders. The Ecological Approach focuses on both the

population-level and individual-level determinants of health and interventions that

is necessary for participants seeking treatment from drug abuse. There are

multiple levels (e.g., public policy, community, institutional, interpersonal, and

intrapersonal factors) that influence the determinants of health. (McLeroy et al.,

1988). This study will focus on the five aspects of this theory, (1) intrapersonal or

individual factors; (2) interpersonal factors; (3) institutional or organizational

factors; (4) community factors; and (5) public policy factors (McLeroy et. al.,

1988).

Many of these constructs could affect the participants outcome in and after

treatment. The substance abuser must first admit they have a problem with drugs

and seek help. Support from the substance abuser's environment (i.e., family,

friends, and/or community) is important for the recovery process. Also, local,

state, and federal laws could determine access to treatment for the substance

abuser seeking help.

Cognitive behavioral therapy for substance use disorders has

demonstrated efficacy as both a monotherapy and as part of combination

treatment strategies. CBT for substance abuse is characterized by

heterogeneous treatment elements; such as operant learning strategies,

cognitive and motivational elements, and skills building interventions. This theory

addresses several core elements which emerge the focus on overcoming the

powerfully reinforcing effects of psychoactive substances (McHugh, Hearon, &

Otto, 2010).

Cognitive behavioral therapy is a common type of talk therapy and an example, is psychotherapy. Mental health counselors (psychotherapist or therapist) work with clients in a structured manner, which consist of a limited number of sessions. CBT helps people become aware of inaccurate or negative thinking to view challenging situations more clearly and respond to them in a more effective way (Mayo Clinic, 2017). This type of therapy can be useful in treating mental health disorders, (e.g., depression, post-traumatic stress disorder (PTSD), eating disorders, and addictions). However, everyone who benefits from CBT does not necessarily have a mental health condition. It can be an effective tool to help anyone learn how to better manage stressful life situations (Mayo Clinic, 2017).

Social cognitive theory (SCT) can also be useful when treating mental health disorders. In 1977 researcher Albert Bandura developed SCT to explain how moral reasoning, in conjunction with other psychosocial factors, governs moral conduct. Social cognitive theory adopts a cognitive interactionist perspective to moral phenomena (Kurtines, Gewirtz, & Lamb, 1991). Within this conceptual framework, personal factors in the form of moral thought and affective self-reactions, moral conduct, and environmental factors all operate as interacting determinants that influence each other bidirectionally (Kurtines, Gewirtz, & Lamb, 1991).

Social cognitive theory has six constructs: (1) *reciprocal determinism* the dynamic and reciprocal interaction of a person with a set of learned experience,

environment external social context, and behavior responses to stimuli to achieve goals; (2) *behavioral capability* understanding and having the skill to perform a behavior; (3) *observational learning* the ability to observe a behavior conducted by others and reproducing those actions; (4) *reinforcements* internal and external responses to a person's behavior that affect the likelihood of continuing or discontinuing the behavior (i.e., negative or positive); (5) *expectations* anticipated consequences of a behavior or consequence of an action; (6) *self-efficacy* confidence in the ability to execute the action despite obstacles or challenges (Glanz, & Rimer, 2005).

Cognitive behavioral theory and social cognitive theory work synergistically with each other for this research study.

Summary

Among those who reported recent opioid use, what effect does having received substance abuse or mental health treatment in the past 12 months have on the amount of days of current opioid use, when controlling for age, gender, race/ethnicity, health insurance, mental and employment was researched?

There are several issues that prevent people from entering substance abuse and mental health treatment for opioid use disorder. Medicaid and other private insurers do not cover all or some of the medications (e.g., *methadone, buprenorphine, naltrexone/suboxone*) to treat opioid use disorders OUDs. Although no research has been found to link "having received substance abuse and mental health treatment in the past 12 months" on the "amount of days of

current opioid use", Volkow et al., (2014) found some Medicaid programs or their managed-care organizations (MCOs) provide limited dosage for OUDs medication and counseling, and only select private insurance plans to provide adequate coverage and services for opioid treatment programs.

Another issue regarding opioid abuse is gender differences that may prevent people with opioid use disorder (OUD) from receiving substance abuse or mental health treatment. Gender-appropriate and culturally responsive health care improves both short- and long-term outcomes, for clients with almost any type of healthcare problem (Centers for Substance Abuse Treatment (U.S.), 2009, p.p. 103-104). The risks of substance abuse, its consequences, and the processes for treatment and recovery also differ by gender, race, ethnicity, sexual orientation, age, and other factors.

OUD affects people across all age groups from young adults to the elderly population. According to previous research, (44.0%) of opioid overdose deaths occur in patients aged 45 to 64 (Chance, 2017). This alarming fact contributes to the opioid epidemic that continues to increase across the U.S. Another barrier for receiving substance abuse treatment is race/ethnicity. The African American and Hispanic populations have lower completion rates for substance abuse treatment apart from opioids (Saloner & Cook, 2013). Socioeconomic barriers in minority populations often prevent people with SUD from completing treatment (Saloner & Cook, 2013).

The opioid epidemic continues to escalate in the United States. Health insurance coverage may be an issue for people with opioid use disorder OUD and "ever received substance abuse and mental health treatment in the past 12 months". This study operates on the premise that there is a relationship among those who reported recent opioid use, and the effect of received substance abuse or mental health treatment in the past 12 months have on the amount of current opioid use.
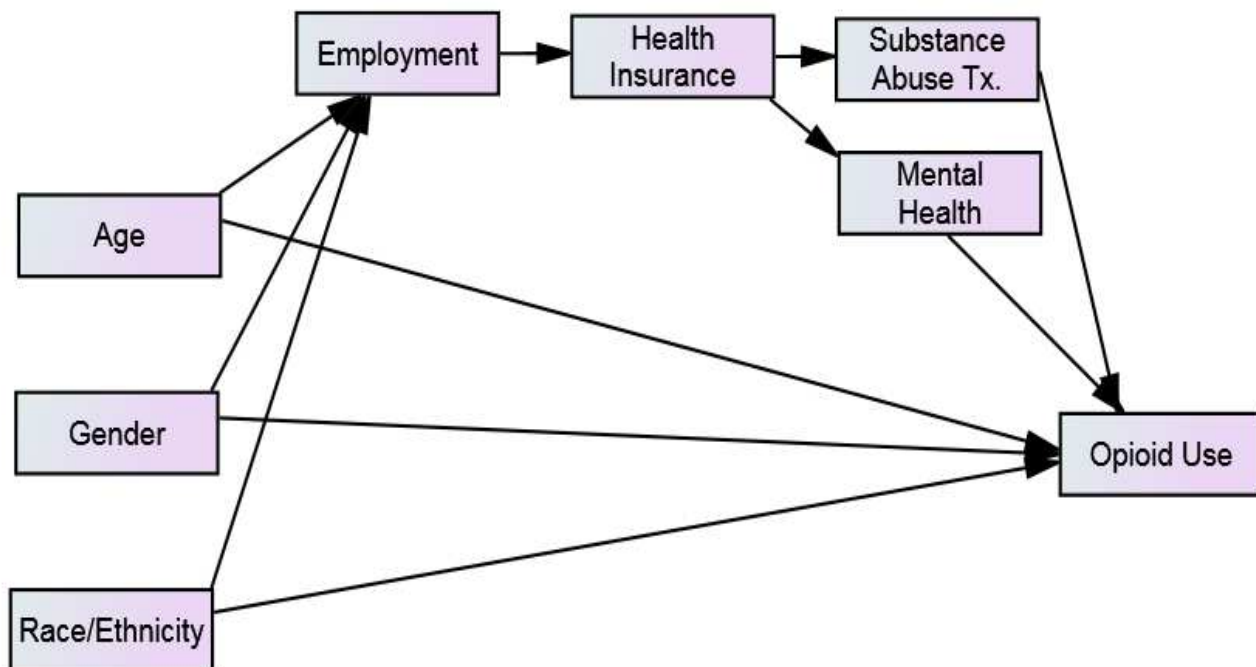
Figure 1. Path model illustrating the path among those who reported recent opioid use, and the effect of participating in substance abuse or mental health treatment in the past 12 months on the amount of days of current use. Control variables health insurance, mental health, employment, age, gender, and race/ethnicity.

CHAPTER III: METHODOLOGY

The research design, sample, population description, data collection and analysis plan are provided in this section. The purpose of this study was to examine the effect of substance abuse and mental health treatment on days of opioid use when controlling for age, gender, race/ethnicity, health insurance, and employment.

Data Source

National Survey on Drug Use and Health (NSDUH) 2016. Data from the National Survey on Drug Use and Health (NSDUH) 2016 were utilized, as the primary purpose of the NSDUH survey was to measure the prevalence and correlation of drug use in the United States. The survey was also designed to provide quarterly and annual estimates. Data were provided on the use of illicit drugs, alcohol, and tobacco among people of the United States in households with aged ranging from 12 and older, and a total of 67,942 participants were sampled (NSDUH, 2017). The NSDUH survey covered drug treatment and participants need for treatment, questions from the Diagnostic and Statistical Manual (DSM) of Mental Disorders were used and the diagnostic criteria was implemented (NSDUH, 2015).

The 2016 NSDUH "design allows for the computation of estimates by state in all 50 states plus the District of Columbia. States may be viewed as the first level of stratification as well as a reporting variable" (NSDUH, 2017). The sample size varied and was chosen from 6,000 area segments.

The change in the state sample allocation was driven by the need to increase the sample in the original 43 small states (to improve the precision of state and sub-state estimates) while moving closer to a proportional allocation in the larger states (NSDUH, 2017). Eight states referred to as the large sample states, had a sample designed to yield 3,600 respondents per State for the 2016 survey (NSDUH, 2017).

Selection of Survey Participants

Selection of Dwelling Units. Data collection progress in each state was monitored during each quarterly survey. Small reserve samples were held back each quarter so that the assigned sample size could be adjusted if necessary during data collection (NSDUH, 2017). During each quarterly survey, field interviewers (FIs) visited each sample address to determine dwelling units (DU) eligibility. FIs collected individual's eligibility requirements (i.e., addresses and sample of individuals to be interviewed) to conduct interviews. Additionally, the "half-open" interval rule HOI is a special procedure that identifies any new housing units (since the time of listing) or any DUs missed during the advance listing process, and this rule was not implemented in the 2016 NSDUH, (NSDUH, 2017).

Eliminating the HOI rule in 2016 decreased the burden on interviewers and simplified training and the screening process. This decrease in burden outweighed the small amount of coverage afforded by the HOI rule. Because the majority of missed dwelling units (DU) are found on the premises of sampled

DUs, the 2016 NSDUH had a procedure in place for checking for and adding

missed DUs on the premises of sampled DUs. During the screening interview,

FIs asked the screening respondent about other units on the property of the

selected DU. If missing from the original list, these DUs also were included in the

sample (NSDUH, 2017).

Measures and Instruments

The NSDUH surveys consist of quarterly and annual estimates. The

surveys contain information on: illicit drugs, alcohol, and tobacco use from

individual's 12 years of age and older residing in households throughout United

States (NSDUH, 2017). The age category was separated into six groups 12-17,

18-25, 26-34, 35-49. 50-64, and 65 or older on the NSDUH 2016 survey. The

NSDUH 2014 through 2017 survey put emphasis on samples in the 26-34 age

group to estimate drug use and related mental health measures more accurately

among the aging drug use population (NSDUH, 2017). Questions included age at

first use as well as lifetime, annual, and past-month usage for the following drug

classes:

- marijuana

- cocaine (and crack)

- hallucinogens

- heroin

- inhalants

- alcohol

- tobacco

- nonmedical use of prescription drugs, including pain reliever

- tranquilizers

- stimulants

- sedatives

Substance abuse treatment is a vital part of the recovery process for drug abusers. The survey covered substance abuse treatment history and perceived need for treatment and included questions from the Diagnostic and Statistical Manual (DSM) of Mental Disorders that allowed diagnostic criteria to be applied. The survey included questions concerning treatment for both substance abuse and mental health-related disorders (NSDUH, 2017).

Respondents were also asked about personal and family income sources and health care access and coverage. Questions introduced in previous administrations were retained in the 2016 survey, including questions asked only of respondents aged 12 to 17. Also retained were questions on mental health and access to care, perceived risk of using drugs, perceived availability of drugs, and personal behavior (NSDUH, 2017).

Beginning in 2008 adult mental health questions were added to NSDUH to measure symptoms of psychological distress in the worst period of distress that a person experienced in the past 30 days and suicidal ideation. In 2008, a split-sample design also was included to administer separate sets of questions World Health Organization Disability Assessment Schedule (WHODAS) and the

Sheehan Disability Scale (SDS) (WHODAS vs. SDS) to assess impairment due to mental health problems. Beginning with the 2009 NSDUH, all the adults in the sample received only the WHODAS questions. Background information includes gender, race, age, ethnicity, marital status, educational level, job status, veteran status, and current household composition (NSDUH, 2017).

Analysis Plan

Data were validated based on a priori criteria. The priori criteria included tests for normality and recoding variables. Heroin and prescription pain reliever use were combined to create a variable to measure the amount of days of current opioid use. For this study heroin and prescription opioid use were measured as 1-30 days of recent use.

Substance abuse treatment in the past year was recoded as having received substance abuse treatment in the past 12 months versus have not received substance abuse treatment in the past 12 months. Variables were assessed for model assumption to determine the appropriateness of conducting and Analysis of Variance. In addition, the dependent variable was assessed for normality by examining skew and kurtosis.

Descriptive statistics, which include the prevalence estimates of selected variables, cross-tabulations for key variables, and statistical analysis were conducted. An Analysis of Variance (ANOVA) was utilized to examine the effect of substance abuse and mental health treatment on days of current opioid use

when controlling for age, gender, race/ethnicity, health insurance, and

employment.

Assumptions

Prior to analysis, the data were tested to assess normality. Results from

participants that did not accurately answer the 2016 NSDUH survey questions (*n*

= 2066) were not analyzed so as to not skew research. Levene's test of Equality

of Error Variances were analyzed for assumption of homogeneity, meaning that

the error variances of all data points of the amount of days of current opioid use

were equal or homogenous throughout the sample (Solutions, 2019).

The Levene's test have proven a trustworthy source for all data retrieval.

According to Montgomery (2017), the modified Levene's test uses the absolute

deviation of the observations in each treatment from the treatment median. It

then evaluates whether the mean of these deviations is equal for all treatments

(Montgomery, 2007). If the mean deviations are equal, the variances of the

observations in all treatments will be the same (Montgomery, 2017).

The Kolmogorov-Smirnov (K-S) test for assumption of normality was

utilized to analyze normal distribution of residuals. A Factorial ANOVA analysis

assumes that the amount of days of current opioid use approximates a normal

distribution, yet it assumes little or no Multicollinearity and should not have any

between-factor effects (Solutions, 2019). Factorial ANOVA assumes the greater

amount of days of opioid use participants attended substance abuse and mental

health treatment in the past 12 months. Still another test known as Parameter

Estimates analyzed interaction effect between substance abuse treatment in the past 12 months on the amount of days of current treatment.

Ethical Issues

This study utilized secondary data. The NSDUH 2016 data is existing, de-identified, and publicly available that underwent institutional review prior to data collection by SAMHSA.

Selected Measures

Independent Variables. Independent variables in the study were having received substance abuse treatment and/or mental health treatment in the past 12 months. The independent variables measured responses to the statements or questions that came from the NSDUH 2016 survey and were recoded for having received substance abuse treatment and/or mental health treatment in the past 12 months. Responses were: yes, no, yes logically assigned, no logically assigned, never used alcohol or drugs, do not know, refused, blank, legitimate skip. The responses for the new variable were: yes and no.

Dependent Variable. The dependent variable in the study was the number of days of current opioid use in the past 30 days. The dependent variable measured responses to the statements or questions that came from the NSDUH 2016 survey. This variable was recoded for amount of days of current opioid use. Responses for the old variable were: 1-30 days, bad data, never used heroin, did not use heroin in the past 30 days, do not know, and blank. The responses for

the new variable were: yes and no. Responses for the old variable were: 1-30 days, did not use prescription pain relievers in the past 12 months, never used/misused prescription pain relievers, did not misuse prescription pain relievers in the past 30 days, do not know, refused, and blank. The responses for the new variable were: yes and no.

Demographic Variables. Control variables age, gender, race/ethnicity, health insurance, and employment status measured responses to the statements or questions that came from the NSDUH 2016 survey. Responses for the age variable were measured in years:

- 12-17
- 18-25
- 26-34
- 35-49
- 50-64
- 65 or older

Responses for the gender variable were male or female. Responses for race/ethnicity variable were:

- Non-Hispanic white
- Non-Hispanic black
- Non-Hispanic Native American Alaskan Native
- Non-Hispanic Native Hawaiian Other Pacific Islander
- Non-Hispanic Asian

- Non-Hispanic more than one race

- Hispanic

The health insurance variable was recoded for having had any health insurance in the past year. Responses were: yes, no, don't know, refused, other missing. The responses for the new variable were: yes and no. Mental health treatment variables were recoded for received any mental health treatment in the past year. Responses were: unknown/aged 12-17, yes, and no. The responses for the new variable were: yes and no. Employment variable were recoded for past 12 months, worked at any job. Responses were: yes, no, don't know, refused, blank, legitimate skip. The responses for the new variable were: yes and no.

CHAPTER IV: RESULTS

Data Analysis

To accurately report the data needed for this study, appropriate software, survey choice, and sample size were imperative to conclude results. Data analysis software IBM Statistical Package for Social Sciences (SPSS) v25 was utilized to conduct this study. Data were used from the National Survey on Drug Use and Health 2016 conducted by the Substance Abuse and Mental Health Services Administration (SAMHSA). The survey sample size consisted of 67,942 participants.

Test of Assumptions. Levene's test indicated that the assumption of homogeneity of variance was met, $F(72, 27) = 1.508$, $p = .117$. Kolmogorov-Smirnov (K-S) test for normality for amount of days of current opioid use [K-S $(865) = 0.258$, $p \leq .001$] indicated that normality was violated; however, the K-S test is sensitive to large sample sizes. Therefore, skew and kurtosis were examined to determine normality (Tabachnick & Fidell, 2013). Skewness was found to be 1.431 and Kurtosis was .686. According to Tabachnick & Fidell, the normality cut-off for Skew or Kurtosis is +1.5 and above -1.5, indicating that the residuals for current opioid use were normally distributed (Tabachnick & Fidell, 2013). Test of assumptions were conducted to make sure the data was useable for this research study.

Descriptive Statistics Results. The analysis of descriptive statistics for amount of days of current opioid use revealed that, on average, participants used

7.89 (9.26) out of the past 30 days. Those who received substance abuse treatment revealed that, on average, participants used 13.90 (11.40) (28.9%) and mental health treatment 10.24 (10.23) (15.1%) in the past 12 months revealed the average amount of days of current opioid use out of the past 30 days 1.52 (.500). Overall, 349 participants (5.4%) reported having received substance abuse treatment and mental health treatment in the past 12 months, while 1488 participants (74.3%) reported they had none.

Results for any health insurance coverage revealed the average for any health insurance coverage out of the past 30 days was 7.73 (9.16). Overall, 51,138 participants (90.6%) reported having health insurance, while 5,283 participants (9.4%) reported they had none.

Results for received mental health treatment in the past 12 months revealed the average was (10.24 (10.23). Overall, 6,408 participants (15.1%) reported receiving mental health treatment in the past 12 months, while 35,954 participants (84.9%) reported they had not.

Results for participants who worked a job in the past 12 months revealed the average was 9.02 (10.06). Overall, 5,233 participants (28.2%) reported being employed in the past 12 months, while 13,293 participants (71.8%) reported they were not.

Results for age and current opioids use revealed the average for age were:

- 12-17 years old current opioid use 4.00 (5.30).

- 18-25 years old current opioid use 7.25 (8.93).

- 26-34 years old current opioid use 9.81 (10.45).

- 35-49 years old current opioid use 9.43 (9.88).

- 50-64 years old current opioid use 9.40 (9.62).

- 65 or older current opioid use 6.00 (6.28).

The age group with the highest opioid usage was 26-34 years old and the age group with the least opioid usage was 12-17 years old.

Results for race/ethnicity current opioid use revealed averages of race/ethnicities:

- Non-Hispanic white 8.49 (9.56).

- Non-Hispanic black 6.40 (8.11).

- Non-Hispanic Native American Alaskan Native 6.47 (9.30).

- Non-Hispanic Native Hawaiian Other Pacific Islander 7.60 (12.58).

- Non-Hispanic Asian 6.00 (8.27).

- Non-Hispanic more than one race 7.48 (8.83).

- Hispanic 6.84 (8.77).

The race/ethnicity with the highest opioid usage was Non-Hispanic white and the race/ethnicity with the least opioid usage was Non-Hispanic Asian. See Table 1 for other descriptive statistics, comparisons, and other control variables. Table 1 shows descriptive statistics from the 2016 NSDUH from the 56,897 participants.

Results for gender revealed the average for men using opioids was 8.31 (9.62) and women was 7.47 (8.88). See Table 1 for detailed Descriptive Statistics results.

Cross tabulations were used in to compare gender with substance abuse treatment, gender with mental health treatment, substance abuse treatment with mental health treatment in the past 12 months, and substance abuse treatment and race. Results can be seen in Tables 2, 3, 4, and 5.

Table 1

Descriptive statistics: 2016 National Survey on Drug Use and Health
(N = 56,897)

Characteristic	*M*	*SD*
Amount of days used opioids past 1-30 days	7.9	9.3
	n	*%*
Ever rcvd alcohol or drug tx past year		
Yes	838	28.9
No	2,066	71.1
Covered by any health insurance		
Yes	51,138	90.6
No	5,283	9.4
Rcvd any mental health tx past year		
Yes	6,408	15.1
No	35,954	84.9
Past year, worked at any job		
Yes	5,233	28.2
No	13,293	71.8
Age		
12-17 years old	14,272	25.1
18-25 years old	13,660	24
26-34 years old	8,751	15.4
35-49 years old	11,361	20
50-64 years old	5,241	9.2
65 or older	3,612	6.3
Gender		
Male	27,141	47.7
Female	29,756	52.3
Race/Ethnicity		
NonHisp White	33,679	59.2
NonHisp Black Afr Am	7,318	12.9
NonHisp Native Am Ak Native	856	1.5
NonHisp Native HI Other Pac Isl	290	0.5
NonHisp Asian	2,437	4.3
NonHisp more than one race	2,130	3.7
Hispanic	10,187	17.9

Note: NonHisp = Non-Hispanic, Afr. Am. = African American, Ak = Alaskan, Hi = Hawaii, Pac. Isl. = Pacific Islander, rcvd = received, tx = treatment.

Table 2

*Cross tabulations for substance abuse treatment and gender: 2016
National Survey on Drug Use and Health*

Gender	*N*	%
Males		
Yes	481	26.6
No	1324	73.4
Total	1805	100.0
Females		
Yes	357	32.5
No	745	67.5
Total	1099	100.0

Note: Compared males to females that received substance abuse treatment in the past
12 months: Males received substance abuse treatment 1.80 (26.60) more than males
1.20 (32.50).

Table 3

*Cross tabulations for mental health treatment and gender: 2016 National
Survey on Drug Use and Health*

Gender	*N*	%
Males		
Yes	1985	10.1
No	17724	89.9
Total	19709	100.0
Females		
Yes	4423	19.5
No	18230	80.5
Total	22653	100.0

Note: Compared males to females that received mental health treatment in the past 12
months: Females received substance abuse treatment 14.90 (19.50) more than twice
than male 7.30 (10.10).

Table 4
Cross tabulations for substance abuse treatment and mental health treatment: 2016 National Survey on Drug Use and Health

Gender	N	%
Males		
Yes	349	48.3
No	377	51.7
Total	722	100.0
Females		
Yes	516	25.7
No	1488	74.3
Total	2004	100.0

Note: Participant that received both substance abuse treatment and mental health treatment in the past 12 months: Had less days of opioid use 1.52 (.500) than participants that did not receive treatment 1.74 (.437).

Table 5

Cross tabulations for substance abuse treatment and race: 2016 National Survey on Drug Use and Health

Race/Ethnicity	N	%
Non-Hispanic White		
Yes	525	26.8
No	1437	73.2
Total	1962	100.0
Non-Hispanic AfrAm		
Yes	96	32.1
No	203	67.9
Total	299	100.0
Non-Hispanic Native Am AK		
Yes	28	25.0
No	84	75.0
Total	112	100.0
Non-Hispanic Native Hi Other Pac Isl	3	21.4
Yes		
No	11	78.6
Total	14	100.0
Non-Hispanic Asian		
Yes	7	31.8
No	15	68.2
Total	22	100.0
Non-Hispanic more than one Race		
Yes	54	38.8
No	85	61.2
Total	139	100.0
Hispanic		
Yes	125	35.1
No	231	64.9
Total	356	100.0

Note: Non-Hispanic AfrAm (Non- Hispanic African American), Non-Hispanic Native Am AK = (Non-Hispanic Native American Alaskan), Non-Hispanic Native Hi Other Pac Isl = (Non-Hispanic Native Hawaiian Other Pacific Islander). Non-Hispanic more than one race had the highest (38.8%) for receiving substance abuse treatment.

Analysis of Variance Results. The analysis revealed a significant interaction between having received substance abuse treatment and mental health treatment in the past year ($F(1, 86) = 4.332$, $p = .040$). An adjusted family-wise alpha of .05 was used for all analyses. A factorial ANOVA for the main effect of substance abuse treatment and mental health treatment on current use revealed a marginally statistically significant effect on current opioid use accounting for (8.9%) of the variance ($F(13, 86) = 1.74$, $p = .067$); this occurred after controlling for health insurance, employment, race/ethnicity, gender, and age, having received substance abuse treatment and/or mental health treatment in the past 12 months. See Table 6 for detailed ANOVA results and Figure 1 for graphical representation of the significant interaction.

Simple Effect of Recent Substance Abuse Treatment. A follow-up factorial ANOVA was completed for the simple effect of substance abuse treatment on current use among those who had mental health treatment in the past year revealed that when controlling for health insurance, employment, race/ethnicity, gender, and age. Those who had substance abuse treatment in the past 12 months use opioids on significantly more days in the past month ($M = 16.47$, $SD = 11.02$) than those who did not have substance abuse treatment in the past month ($M = 9.98$, $SD = 10.04$), ($F(1, 41) = 8.82$, $p = .005$). Among those who had mental health treatment in the past year, substance abuse treatment accounted for (15.8%) of the variance in current opioid use.

The simple effect of substance abuse treatment on those who currently use among those who did not have mental health treatment in the past year

revealed that when controlling for health insurance, employment, race/ethnicity, gender, and age. Those who had substance abuse treatment in the past 12 months (M = 12.70, SD = 11.80) and those who did not have substance abuse treatment in the past month (M = 10.10, SD = 10.70), (F(1, 41) = .339, p = .565 had no significant difference. Results for the Estimated Marginal Means (EMM) for this study is provided in the interaction Graph. See Figure 2 for results.

Figure 2.   Main Effect Interaction
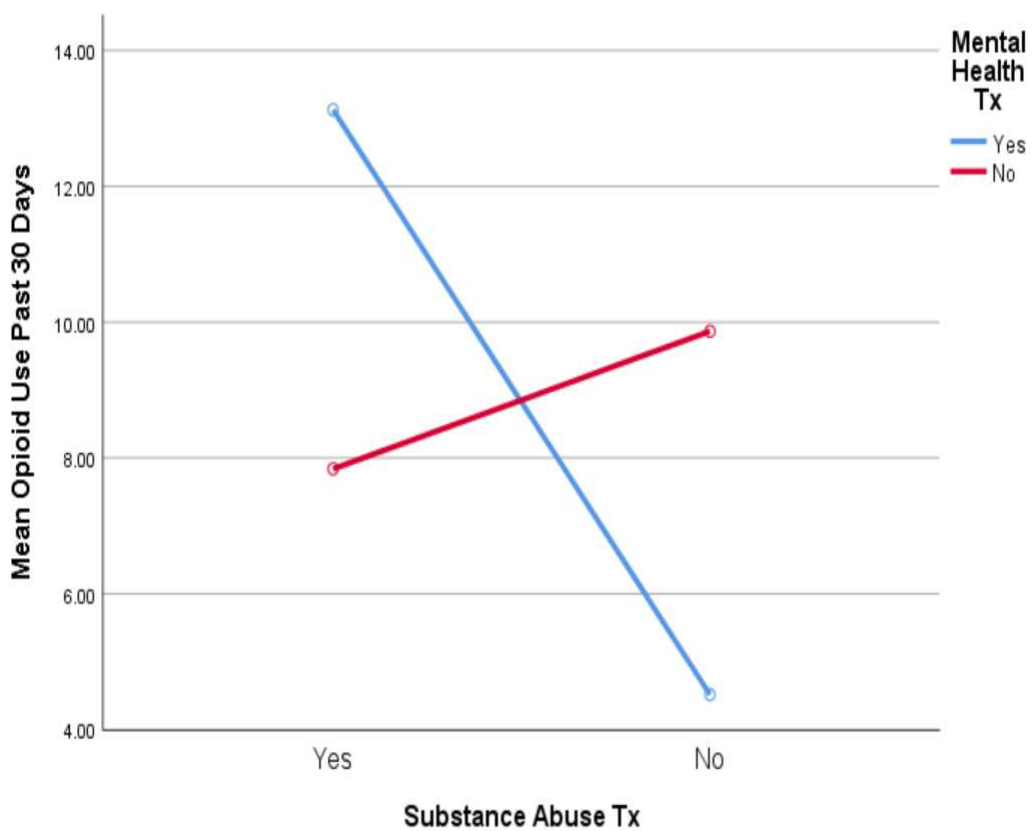
Figure 2. Interaction effect of substance abuse treatment and mental health treatment on current opioid use.

Table 6

Analysis of variance for participation in drug treatment or counseling: 2016
National Survey on Drug Use and Health ($N_{weighted}$ = 56,897)

Source	Tests of Between-Subjects Effects			
	MS	*df*	*F*	*p*
Overall Model	*210.880*	*13*	*1.74*	*.067*
Factors:				
Received Substance Abuse Tx Past Year	279.735	1	2.308	.132
Covered by any Health Insurance	221.006	1	1.824	.180
Received Mental Health Tx Past Year	6.202	1	.051	.822
Past Year Worked at any Job	364.821	1	3.010	.086
Gender	448.801	1	3.703	.058
Race/Ethnicity	210.588	4	1.738	.149
Age	72.004	3	.594	.621
Interactions:				
Substance Abuse and Mental Health Tx	524.997	1	4.332	.040
Error	124.372	83		

Note: η^2 R^2 = .089,

CHAPTER V: DISCUSSION AND CONCLUSION

Discussion

The purpose of this study was to examine if substance abuse and mental health treatment in the past 12 months had an effect on the amount of days of current opioid use. Opioid abuse is a severe public health problem affecting many communities in the nation. An increasing number of individuals are using heroin and opioid prescription drugs for non-medical purposes at alarming rates. The National Institute of Drug Addiction (NIDA) reported that 2 million people are addicted to opioids in the U.S. (2014). Addiction is considered a disease of the brain that affects many people with substance abuse disorder (SUD) and mental health illness (MHI). This study revealed a significant interaction between substance abuse treatment and mental health treatment in the past 12 months on the amount of days of current opioid use, indicating that the effect of substance abuse treatment on current opioid use differs depending on if the individual had also undergone mental health treatment.

The brain disease model of addiction describes the underlying neurobiology of addiction including the link between addiction and brain function (Volkow, Koob, and McLellan, 2016). The neurobiology of addiction increases strength of conditioned responses and stress reactivity, which results in increased cravings for alcohol and other drugs and negative emotions (Volkow, Koob, and McLellan, 2016). The model is relevant to this research study because individuals with substance abuse disorder (OUD) and mental health illness (MHI)

seek pleasure from drug usage. OUD and MHI can limit an individual's ability to feel pleasure and the motivation to pursue everyday activities. (Volkow, Koob, and McLellan, 2016). When cravings are not satisfied weakening of the brain regions involved in executive functions (i.e., decision-making, inhibitory control, and self-regulation) leads to repeated relapse (Volkow, Koob, and McLellan, 2016).

The results of this study indicate a need for effective and evidence-based substance abuse and mental health treatment for people with dual addictions. The NSDUH reports that mental health illnesses (MHI) and substance abuse disorder (SUD) are conditions that coexist. A major problem is that the two disorders often go untreated and the dually addicted individual with an underlying condition that needs services goes untreated. (SAMHSA, 2017). An example of this concern is the many people with post-traumatic stress syndrome fall into the category of dual addiction.

The traditional view on the link between substance dependence and PTSD is that individual's first experience trauma, and in an effort to self-medicate and treat their symptoms, they begin using drugs, which later develops into an addiction (Columbus, 2018). Because this is such a prevalent occurrence, substance abuse treatment providers have the task of treating co-occurring mental disorders without adequate training or certification for mental health professional (Flynn, & Brown, 2008, pp. 36-47). Many substance abusers with mental health disorders have experienced adverse childhood experiences (ACE).

ACE has three categories: abuse (i.e., physical, sexual, or mental), neglect (i.e., physical or emotional), and household dysfunction (i.e., mental illness, incarceration of a relative, substance abuse, mother treated violently, or divorce) (McClafferty, 2016).

The ACE pyramid shows the mechanisms by which ACE manifest influence health and well-being, and health outcomes ("Adverse Childhood Experiences Presentation Graphics," n.d.). The following is the structure of the ACE pyramid from the bottom level up through adverse childhood experiences; disruptive neurodevelopment; social, emotional, and cognitive impairment; adaptation of health-risk behaviors; disease, disability, and social problems; and early death (McClafferty, 2016). When people with opioid use disorder and mental health illness participate in substance abuse treatment, both disorders need to be addressed, including medication stability (U.S. Department of Health and Human Services; National Institute of Health; and National institute on Mental Health, 2012). There are treatment facilities that manage individuals with coexisting disorders; however, finding these types of facilities can be difficult. When opioid users or substance abusers, in general, do not have healthcare coverage or enough coverage to receive the proper treatment needed to recover, the drug epidemic continues.

Ecological Approach, Social Cognitive Theory and Behavioral Cognitive Theory for health promotion and disease prevention are the theoretical frameworks for this study. One of the constructs of the theoretical focuses is

public policy that is vital to the treatment of opioid use in the U.S. The policies

and laws that regulate or support healthy practices and actions by Medicaid

includes some insurance providers with limited coverage for opioid medications.

Limited medication coverage for opioid use disorder (OUD) and mental health

illness (MHI) affects the health and population at large (Khadka, 2019). This is a

major issue for people with OUD seeking treatment.

Many health insurance plans cover OUD medications but include

limitations on specific medications and drug counseling. About (14.0%) of

healthcare plans do not cover any formulations of *buprenorphine* and *naloxone*

(Harvard School of Medicine, 2018). Plans were more likely to require prior

authorization for any of the covered office-based *buprenorphine* or *naltrexone*

formulations preferred for maintenance OUD treatment (e.g., *buprenorphine* and

naloxone, b*uprenorphine* implants, injectable long-acting *naltrexone*) than of

short-acting opioid pain medications (63.6%) vs. (19.4%); *p* < 0.001) (Harvard

School of Medicine, 2018). Only (10.6%) of plans cover implantable

buprenorphine, (26.1%) cover injectable *naltrexone*, and (73.4%) cover at least 1

abuse-deterrent opioid pain medication (Harvard School of Medicine, 2018).

Coverage for short-term residential, long-term residential, and recovery support

services (e.g., behavioral counseling) have limitations under Medicaid in more

than 80% of states and the District of Columbia (Grogan et al., 2016).

Researchers Han et al., (2015) found that the prevalence of prescription opioid

use disorders was higher among users without health insurance and among

users with Medicaid than among users with private health insurance only (Han et

al., 2015). Making OUD treatment health coverage available with no limitations on specific medications a part of every healthcare insurance plan both public and private would be beneficial in receiving the type of drug treatment (e.g., detoxification, residential in-patient, out-patient, MAT, OBOT, and individual behavioral counseling) for opioid abusers.

While health insurance plans may or may not cover medications, Medicaid programs in all states and the District of Columbia (n = 51) provided coverage for *buprenorphine*, and almost all states and the District of Columbia (n = 48) covered injectable *naltrexone*. There was also widespread coverage for oral *naltrexone* (n = 34) and *methadone* (n = 32) in these states (Grogan et. al., 2016).

A legal action case in the State of New York against Value Options and two other managed-care organizations (MCO) for alleged discrimination against patients that were wrongly denied addiction and mental health benefits after a comparison to patients with diabetes was filed (Bevilacqua, and Goldman, 2009). The legal action occurred based on the number and extent of preauthorization required for treatment of SUD patients versus those with diabetes. The arbitrary and capricious manner insurers stopped treatment and provided or suggested treatment alternatives to patients with SUD was a form of discrimination (Bevilacqua, and Goldman, 2009). Patients with SUD have proven to be more of a health risk than those with other diseases such as diabetes according to some healthcare and MCO plans (Bevilacqua, and Goldman, 2009). This case and

other similar cases affect many individuals with substance abuse and mental health disorders that need treatment.

Substance abuse treatment has been effective in treating the disease of addiction for many years as mentioned in the literature review of this study. However, many people with SUD lack a strong family support system, have time limitations and must adhere to the type of treatment (i.e., OTPs) they can receive from healthcare providers dictated by insurance companies preventing treatment success regardless of the statistics that have proven treatment with medication and counseling to be affective.

Opioid agonist medication-assisted treatment (OA-MAT) with methadone or buprenorphine is the most effective treatment for opioid use disorder (World Health Organization, 2009). Medications used for MATs have proved effective in helping opioid users recover if properly monitored. Medications used in MAT programs prove to be safe, reduce the risk of overdose, and to be cost effective (Florence et al., 2016). Over $78 billion a year in healthcare, criminal justice, and lost productivity has had resulted from the opioid epidemic (Florence et al., 2016). Research suggests that all three FDA approved medications show improved patient retention in treatment compared to placebo or no medication (Connery, 2015). *Buprenorphine* versus *methadone* maintenance comparisons are available, with *methadone* demonstrating the highest rates of treatment retention in all studies (Mattick, Breen, Kimber, & Davoli, 2014).

Medication-assisted treatment is the recommendation for adults in clinical treatment of OUD with physiological dependence (Connery, 2015, p. 69). "MAT significantly augments treatment retention, reduces illicit opioid use, reduces the burden of opioid craving, and in the case of agonist therapies, provides effective relief of the opioid withdrawal syndrome" (Connery, 2015, p. 69). MAT is a stabilizing addition to relapse-prevention counseling and mutual help groups (i.e., Narcotics Anonymous) increasing the effectiveness of those interventions (Connery, 2015, p. 69).

At the state level, research indicated significant variation in treatment need compared to capacity, with most states having higher rates of treatment need than treatment capacity (Jones et al., 2015). Most opioid treatment programs (OTPs) were functioning at 80% or more capacity, suggesting that they would not be able to handle a considerable number of new patients (Jones et al., 2015). In connection with these treatment needs and capacity restrictions, several factors exist between adoption and diffusion of MAT. These factors include differences in Medicaid and other insurance coverage, state licensing and regulation of treatment facilities, facility-funding sources, and parity laws (Ducharme & Abraham, 2008; Heinrich & Cumming, 2014).

Another construct (i.e., interpersonal, and intrapersonal or individual factor) of the Ecological Approach used for this study places emphasis on genetic, environmental, and social factors that contribute to an individual's susceptibility to initial drug use. These factors sustain drug use and help to

undergo progressive changes in the brain that characterizes addiction (Demers,

Bogdan, and Agrawal, 2014; Volkow and Muenke, 2012).

Factors that increase vulnerability to addiction include family history

(through heritability and child-rearing practices) and early exposure to drug use

(adolescence is among the periods of greatest vulnerability to addiction) (Burnett-

Zeigler, et al., 2012). Exposure to high-risk environments (i.e., typically, socially

stressful environments with poor family and social supports, restricted behavioral

alternatives, environments in which there is easy access to drugs, permissive

normative attitudes toward drug taking) contributes to such vulnerability to

addiction (Burnett-Zeigler, et al., 2012). Additionally, certain mental illnesses (i.e.,

mood disorders, attention deficit–hyperactivity disorder, psychoses, and anxiety

disorders) are factors in this as well (Burnett-Zeigler, et al., 2012). Vulnerability to

addiction also, effects and individual's ability successfully obtain and/or maintain

employment.

There are several reports in the media about opioid use influencing the

employment rate. The research studies indicated that opioid use could contribute

to the rise in the unemployment rate. Work related-injuries with workers

compensation (WC) or short-term disability (STD) claims from prescription pain

reliever abuse effects employment. The research study conducted on the county

level showed counties with higher poverty and unemployment rates particularly

had higher rates of retail opioid sales and opioid prescriptions filled by Medicare,

as well as drug overdose deaths and opioid-related hospitalizations (Johnston et. al., 2016).

In addition, poverty and unemployment rates are highly correlated with the prevalence of opioid abuse according to the research in this study. In many socioeconomically challenged communities, opioid use is a factor that contributes to the unemployment rate and continue to affect the poverty level. The research indicated that unemployed individuals are more likely to use mind mood-altering substances than individuals with employment and can be gender specific.

The research from this study indicated differences among gender and opioid use disorder (OUD). According to the literature, women are more likely to become dependent on pain medication faster than men become dependent. This is a phenomenon known as "telescoping." Telescoping is the progression of time from first use of addictive substances to dependence on that or other substance (SAMHSA, 2015). Telescoping consist of several components (i.e., body fat percentage, metabolic rate, and hormonal fluctuation of women (OWH, 2017). Also, maternal opioid use due to heroin dependency is increasing at alarming rates according to research conducted by Patrick et al., 2012; Patrick et al., 2015. Neonatal abstinence syndrome (NAS) is the result of prenatal maternal opioid use. NAS is a drug withdrawal syndrome that most commonly occur in infants after in utero exposure to opioids; has also been associated with this syndrome (Ko et al., 2017).

In addition, according to Hansen (2017) women are more susceptible to prominent levels of emotional distress that result from a multitude of factors (i.e., chronic pain, work, family, school, or caretaker of elderly parents). These issues described could contribute to opioid abuse in both men and women however, women are more susceptible. Research conducted by Hansen, (2017) indicated white middle-class women are the new face of opioid addiction (Hansen, 2017).

Although race/ethnicity had no significant effect on the amount of days of current opioid use in this research study. According to Martin et al., (2015) opioid use disorder (OUD) affects every race/ethnicity (2015). The research study results indicated the ethnic group with the highest opioid abuse is Non-Hispanic Whites Non-Hispanic Blacks Non-Hispanic Asians having the lowest.

White Americans were twice as likely to die from drugs and related causes as black Americans die (Schrager, 2015). It is imperative to include race/ethnicity in research surrounding drug abuse or addiction to account for cultural and age differences because each race/ethnicity have diverse cultural values and beliefs.

The research results indicated the age group with the most days of substance abuse treatment and the amount of days of opioid use is 18-25 years old at (29.5%). The next age group with the most days of substance abuse treatment results indicated was 26-34 years old with (25.9%) days of participating in substance abuse treatment in the past year and the effect on the amount of days of current opioid use. The review of literature for this study indicated the

age group with the greatest use for nonmedical opioids is young adults aged 18-25 (NIDA, 2016; NIH, 2016; USDHHS, 2016).

Future Research

More in-depth research is necessary to provide adequate treatment among those who reported recent opioid use and what effect having received substance abuse and mental health treatment have on the amount of days of current opioid use. Understanding this relationship could lead to developing an educational prevention and intervention models to decrease the prevalence of opioid use. Through the application of strategic methods of engagement with active opioid abusers in the communities (i.e., drug houses), in-depth research on treatment retention, homelessness, and addressing guilt, shame, stigma and a support system could benefit from continuous research.

Interpersonal processes (i. e., motivational and behavioral) social interaction along with group support are exceptionally important for people with OUD. Lack of a support system for the opioid user limits their chances to becoming drug free. Providing education from research findings about these issues could affect the opioid epidemic and help decrease opioid abuse.

The study results from the Analysis of Variance (ANOVA) interaction effect examined if substance abuse and mental health treatment in the past 12 months have an effect on the amount of days of current opioid use and was found to be

significant. The research provided information that substance abuse and mental health disorders do coexist. Therefore, providing adequate mental health training and certifications to substance abuse treatment providers will give people with opioid use disorder (OUD) a better opportunity to successfully complete treatment and improve recovery outcomes.

Limitations

Although NSDUH is useful for many purposes, it has certain limitations. First, the data are self-reports of drug use, and their value depends on respondents' truthfulness and memory. Although some experimental studies have proven the validity of self-reported data in similar contexts, the NSDUH procedures were designed to encourage honesty and recall; however, it is possible that underreporting and overreporting may take place. To aid respondent recall, the prescription drug questions in 2016 also allowed respondents to report any use or misuse in the past 30 days of specifically related medications. These self-reports capture information on the use or misuse of prescription drugs that contain a given active ingredient. However, these self-reports are not necessarily exact in identifying the specific drugs that respondents took, especially when respondents identify certain drugs by their brand names (NSDUH, 2017). For this reason, the public use file includes recoded variables for subtypes of related prescription drugs but with few exceptions does not include variables for individual prescription drugs (NSDUH, 2017).

Second, the survey is cross-sectional rather than longitudinal. That is, individuals were interviewed only once and were not followed for follow-up interviews in subsequent years. Each year's survey, therefore, supplies an overview of the prevalence of drug use at a specific point in time rather than a view of how drug use changes over time for specific individuals (NSDUH, 2017).

Third, because the priority population of the survey was defined as the civilian, noninstitutionalized population of the United States, a small but sizeable proportion approximately (3.0%) of the population is excluded. The subpopulations excluded are members of the active-duty military and individuals in institutional group quarters (e.g., hospitals, prisons, nursing homes, treatment centers). If the drug use of these groups differs from that of the civilian, noninstitutionalized population, NSDUH may supply slightly inaccurate estimates of drug use in the total population. This may be particularly true for prevalence estimates for less commonly used drugs, such as heroin (NSDUH, 2017).

There are limitations due to the lack of substance abuse treatment facilities. The research study results revealed the lack of adequate substance abuse treatment facilities for opioid users may contribute to continued opioid use. If there is limited or no accessibility to treatment facilities, limitations on opioid treatment programs (OTPs), wait listing, lack of health insurance and mental health service within a substance abuse treatment facility, or opioid users not wanting to seek treatment for several reasons, the opioid epidemic continues to soar.

Conclusion

This study's results indicated that among those who reported recent opioid use, the effect that having received substance abuse and mental health treatment has on the amount of current opioid use can help providers determine if participation in substance abuse treatment help decrease opioid abuse. The Ecological Approach is an appropriate method for this research study. It focuses on the population-level as well as the individual level when studying determinants of health and intervention strategies. All the following constructs (i.e., public policy, community, institutional, interpersonal, and intrapersonal factors) are important to decreasing the opioid epidemic and adequate substance abuse or mental health treatment for people with OUD. Both social cognitive theory and behavioral cognitive theory address behavioral, personal, and environmental factors opioid users face.

One of the major factors to reduce the prevalence of opioid abuse is education. Providing information from this research study to educate our physicians in hospitals, teachers in the school system, and leaders in the community, senators, and representatives on both state and federal government levels is necessary and could make an impact on one of the most epic drug epidemics in this country. Educational seminars and workshops for government leaders to make policy changes to healthcare insurance coverage and allocate funding is crucial to the opioid epidemic. Opening more opioid treatment (e.g.,

MAT) facilities in locations for the opioid users that need services may reduce the abuse of opioids.

Policy and societal barriers prevent broad dissemination, access, and adoption of highly effective MAT facilities for people with OUD (Comptom, Boyle, Wargo, 2015; Volkow, Frieden, Hyde, Cha, 2014; Olsen, and Sharfstein, 2015). The urgency for the development of more opioid drug treatment facilities has come about in the United States. The research study results for having received substance abuse treatment and mental health treatment in the past 12 months indicated a statically significant effect on the amount of days of current opioid use. These results could have a positive impact on the opioid epidemic. In addition, opioid treatment programs (OTP's) that are licensed and equipped with physicians, counselors, and staff that are qualified to provide opioid users adequate help, is imperative to opioid abusers being successful in treatment.

Addressing the strongest risk that contributes to the increase in heroin and opioid prescription pain reliever abuse, is a key factor in fighting the opioid epidemic. Some risk factors include (i.e., limited access to opioid treatment services (MAT); training healthcare professionals to administer medications to reduce overdose/deaths; and opioid abusers' access to integrated prevention services (Substance Abuse Mental Health Services Administration, 2016; Office of the Surgeon General, 2016).

Other risk factors, for local jurisdictions to put effective practices to work in communities where opioid drug addiction is common; evidence-based training for

healthcare providers to make informed decisions and ensure the appropriate

prescribing for opioid medications. Stricter prescribing guidelines for chronic pain,

implementation of prescription drug monitoring programs (electronic databases

that track the dispensing of certain drugs) are needed as a part of clinical

practice routine (Substance Abuse Mental Health Services Administration, 2016;

Office of the Surgeon General, 2016).

There are several methods for reduction of the prevalence of opioid use and

increased access to opioids abuse treatment services. Through the Affordable

Care Act: supports the development and distribution of the life-saving drug (i.e.,

naloxone) to reduce prescription opioids and heroin overdose deaths. Also, to

support opioid abuse research, the development and approval of pain

medications that are less prone to abuse and improve surveillance to better track

trends in opioid abuse to decrease opioid deaths. The ACA supports qualified

healthcare workers in identifying and to providing help to at risk communities and

implementing effective evidence-based prevention strategies through grant

funded programs (Substance Abuse Mental Health Services Administration,

2016; Office of the Surgeon General, 2016).

The National Institutes of Health (NIH), a component of the Department of

Health and Human Services, is the nation's leading medical research agency

helping to solve the opioid crisis through the discovery of new and better

methods to prevent opioid misuse, treatment of opioid use disorders, and

manage of pain. In the summer of 2017, NIH met with pharmaceutical companies

and academic research centers to discuss: safe, effective, non-addictive strategies to manage chronic pain; new, innovative medications and technologies to treat opioid use disorders; and improved overdose prevention and reversal interventions to save lives and support recovery (NIH, 2018). There is no cure for the disease of addiction, but like other diseases it is manageable.

There are evidence-based treatments programs for opioid use disorder (OUD); however, most Americans at risk for or with an OUD do not receive evidence-based prevention and treatment services (Volkow et al., 2014). To better understand how the integration of promising and evidence-based strategies and treatments might decrease OUD, overdose events and deaths, NIH will deploy a suite of implementation science efforts to test the integration of evidence-based interventions in an array of settings (Hedegaard, Warner, & Minino, 2016; CDC, 2017, National Center for Health Statistics, 2016).

The opioid crisis affects most Americans in some manner; therefore, it is important to develop partnerships with patients, advocates, academic experts, private sector leaders, and federal partners to identify the greatest needs and areas of opportunity for aiding people with OUD (NIH, 2018). The National Institutes of Health received recommendations from the President's Commission on Combating Drug Addiction and the Opioid Crisis, the National Pain Strategy and the Federal Pain Research Strategy (NIH, 2018). Opportunities found through these collaborations ultimately serve as the foundation for major research to continue in this area.

References

Adverse Childhood Experiences Presentation Graphics. (n.d.). Retrieved from

https://www.cdc.gov/violenceprevention/childabuseandneglect/acestudy/

ce-graphics.html

American College of Obstetricians and Gynecologist. (2017). *Women's Health

Care Physicians*. Retrieved June 25, 2018, from

https://www.acog.org/Patients/FAQs/Tobacco-Alcohol-Drugs-and

Pregnancy

American Psychiatric Association. (n.d.). What is posttraumatic stress disorder?

Retrieved from https://www.psychiatry.org/patients-families/ptsd/what-is

ptsd

American Society of Addiction Medicine. (2015). The ASAM national practice

guideline for the use of medications in the treatment of addiction involving

opioid use http://www.asam.org/docs/default-source/practice

support/guidelines-and consensus-docs/asam-nationalpractice-guideline

supplement.pdf?sfvrsn=24; and

American Society of Addiction Medicine. (2011). ASAM releases new definition of

addiction. *American Society of Addiction Medicine, 26*(3).

Andrews, C.M., Shin H.C., Marsh J.C., Cao, D. (2013). Client and program

characteristics associated with wait time to substance abuse treatment

entry. *American Journal of Drug and Alcohol Abuse*, *39*(1), 61-68.

DOI: 10.3109/00952990.2012.694515

Beaudoin, F. L., Merchant, R.C., & Clark, M. A. (2016). Prevalence and detection

of prescription opioid misuse and prescription opioid use disorder among

emergency department patients 50 years of age and older: Performance

of the Prescription Drug Use Questionnaire, patient version. *American*

Journal of Geriatric Psychiatry. 24(8), 627–636.

Bevilacqua, L., & Goldman, D. (2009). Genes and addictions. *Clinical*

pharmacology and therapeutics, *85*(4), 359-61.

Birnbaum, H.G., White, A. G., Schiller, M., Waldman, T., Cleveland, J. M., &

Roland, C. L. (2011). Societal costs of prescription opioid abuse,

dependence, and misuse in the United States. *Pain Medicine Malden*

Massachusetts, 12(4):657-667. doi:10.1111/j.1526-4637.2011.01075.x

Bonnie, R. J., Ford, M. A., & Phillips, J. K. (2017). National Academies of

Sciences, Engineering, and Medicine; Health and Medicine Division;

Board on Health Sciences Policy; Committee on Pain Management and

Regulatory Strategies to Address Prescription Opioid Abuse; Pain

management and the opioid epidemic: Balancing societal and individual

benefits and risks of prescription opioid use. Washington (DC): *National*

Academies Press (US); 4 Trends in opioid use, harms, and treatment.

Retrieved from https://www.ncbi.nlm.nih.gov/books/NBK458661/

Bradbury, A. (2019). Mental health and substance use disorders. Retrieved from

   https://www.samhsa.gov/find-help/disorders

Brogly, S.B., Saia, K.A., Walley, A.Y., Du, H.M., & Sebastiani, P. (2014). Prenatal

   buprenorphine versus methadone exposure and neonatal outcomes:

   systematic review and meta-analysis. *American Journal of Epidemiology*

   180(7), 673-686. doi:10.1093/aje/kwu190

Burnett-Zeigler, I., Walton, M. A., Ilgen, M., Barry, K. L., Chermack, S. T., Zucker,

   R. A., Blow, F. C. (2012). Prevalence and correlates of mental health

   problems and treatment among adolescents seen in primary care. *Journal*

   of Adolescent Health, 50(6), 559-564.

   doi:10.1016/j.jadohealth.2011.10.005

Center for Behavioral Health Statistics and Quality. (2017). *Results from the*

   2016 National Survey on Drug Use and Health: Detailed tables. Retrieved

   from https://www.samhsa.gov/data/

Centers for Disease Control and Prevention. (n.d.). Module 5: Assessing and

   Addressing Opioid Use Disorder (OUD). Retrieved from

   https://www.cdc.gov/drugoverdose/training/oud/accessible/index.html

Centers for Disease Control and Prevention. (2017). Analysis of the National

   Vital Statistics System Multiple Cause of Death data: Wide-ranging Online

   Data for Epidemiologic Research (WONDER). Retrieved from:

   https://www.cdc.gov/drugoverdose/opioids/heroin.html

Center for Disease Control and Prevention. (2017). Opioid Overdose. Retrieved

from: April 16, 2018, from

https://www.cdc.gov/drugoverdose/epidemic/index.html

Centers for Disease Control and Prevention. (2017). Opioid overdose. Retrieved

from https://www.cdc.gov/drugoverdose/opioids/terms.html

Center for Disease Control and Prevention. (2016). Prescription opioid overdose

data. Retrieved from: https://www.cdc.gov/drugoverdose

/data/overdose.html

Center for Disease Control and Prevention. (2015). National Center for Health

Statistics. Multiple causes of death 1999-2014 on CDC WONDER online

database, released 2015. Data are from the Multiple Cause of Death Files,

1999 to 2014, as compiled from data provided by the 57 vital statistics

jurisdictions through the Vital Statistics Cooperative Program. Retrieved

from: http://wonder.cdc.gov/mcdicd10.html

Center for Disease Control and Prevention. (2015). Opioid painkillers widely

prescribed among reproductive age women [press release]. Retrieved

from: http://www.cdc.gov/media/relelase/2051/p0122-pregnancy

opioids.html

Centers for Disease Control and Prevention. (2013). Vital signs: Overdoses of

prescription opioid pain relievers and other drugs among women in the

United States, 1999-2010. *Morbidity and Mortality Weekly Report, 62*(26), 537-542.

Center for Substance Abuse Treatment. (2009). Substance abuse treatment: Addressing the specific needs of women. Treatment Improvement Protocol (TIP) Series 51. HHS Publication No. (SMA) 09-4426. Rockville, MD: Substance Abuse and Mental Health Services Administration

Chance, K. (2017). Understanding the opioid addiction problem. Arrowhead Lodge Recovery. Retrieved from: https://arrowheadlodgerecovery.com/middle-aged and-senior-adult-opioid addiction-in-america/

Cicero, T.J., Ellis, M.S., Surratt, H.L., & Kurtz, S.P. (2014). The changing face of heroin use in the United States: A retrospective analysis of the past 50 years. *Journal of the American Medical Association Psychiatry, 71*(7), 821-826.

Coomber, R., & Moyle, L. (2017). The changing shape of street-level heroin and crack supply in England: commuting, holidaying and cuckooing drug dealers across county lines. *The British Journal of Criminology*. azx068, https://doi.org/10.1093/bjc/azx068

Compton, W. M., Boyle, M., Wargo, E. (2015). Prescription opioid abuse: Problems and responses. *Preventive Medicine, S0091-7435*(15), 00103-6. doi:10.1016/j.ypme.2015.04.003.25871819

Connery, H. S. (2015). Medication-Assisted Treatment of opioid use

    disorder. *Harvard Review of Psychiatry*, *23*(2), 63–75.

    doi:10.1097/hrp.0000000000000075

Dahlhamer, J., Lucas, J., Zelaya, C., Nahin, R., Mackey, S., DeBar, L.,

    Helmick, C. (2018). Prevalence of chronic pain and high-impact chronic

    pain among adults - United States, 2016. *Morbidity and Mortality*

    Weekly Report, *67*(36), 1001–1006. doi:10.15585/mmwr.mm6736a2

Dart, R.C., Surratt, H.L., Cicero, T.J., Theodore, D., Parrino, M.W., Severtson,

    S.G., Bartelson, B.B., & Green, J.L. (2015). Trends in opioid analgesic

    abuse and mortality in the United States. *New England Journal of*

    Medicine, 372, 241-248. doi:10.1056/NEJMsa1406143

Dawson, D. A., Li, T. K., Chou, S. P., & Grant, B. F. (2007). Transitions in and

    out of alcohol use disorders: their associations with conditional changes in

    quality of life over a 3-year follow-up interval. *Alcohol and alcoholism*

    (Oxford, Oxfordshire), *44*(1), 84-92.

Demers, C. H., Bogdan, R., & Agrawal, A. (2014). The genetics, neurogenetics

    and pharmacogenetics of addiction. *Current Behavioral Neuroscience*

    Reports, 1(1), 33-44. doi:10.1007/s40473-013-0004-8

Department of Health and Human Services. (2016). Key substance use and

    mental health indicators in the United States. Results from the 2015

    National Survey on Drug Use and Health. HHS Publication SMA 16-4984,

NSDUH Series H-51. Rockville, MD: Substance Abuse and Mental Health

Services Administration.

Diagnostic and statistical manual of mental disorders: DSM-5. (2013). *American Psychiatric Association*. Arlington, VA.

Drug Enforcement Administration. (2018). DEA / Drug Scheduling. (n.d.).

Retrieved from https://www.dea.gov/druginfo/ds.shtml

Drug Enforcement Administration. (2016b). DEA Requirements for DATA Waived

Physicians. https://www.deadiversion.usdoj.gov/

pubs/docs/dwpbuprenorphine.htm; American Society of Addiction

Medicine, The ASAM National Practice Guideline

Drug Enforcement Administration. (2016). National drug threat assessment

summary. Retrieved from: https://www.dea.gov/resource

center/2016%20NDTA%20Summary.pdf (accessed April 16, 2018).

Drug Enforcement Administration. (2013). National drug threat

assessment. https://www.dea.gov/resource-center/DIR-017

13%20NDTA%20Summary%20final.pdf (accessed April 2, 2018).

Ducharme, L. J., & Abraham, A. J. (2008). State policy influence on the early

diffusion of buprenorphine in community treatment programs. *Substance Abuse Treatment Prevention Policy, 3*(1), 1.

Dupont, R. L. (2018). The opioid epidemic is a historic opportunity to improve

both prevention and treatment. *Brain Research Bulletin, 138*(112-114).

doi:10.1016/j.brainresbull.2017.06.008

DuPont, R.L., Compton, W.M., & McLellan, A.T. (2015). Five-year recovery: a

new standard for assessing the effectiveness of substance use disorder

treatment. *Journal of Substance Abuse Treatment, 58*(1-5).

Dutra, L., Stathopoulou, G., Basden, S. L., Leyro, T. M., Powers, M. B., & Otto,

M. W. (2008). A Meta-Analytic Review of psychosocial interventions for

substance use disorders. *American Journal of Psychiatry,165*(2), 179-187.

doi:10.1176/appi.ajp.2007.06111851

El-Bassel, N., Shaw, S.A., Dasgupta, A., Strathdee, S.A. (2014). Drug use as a

driver of HIV risks: reemerging and emerging issues. *Current Opinion HIV

AIDS, 9*(2), 150-155. doi:10.1097/COH.0000000000000035

Fajemirokun-Odudeyi, O., Sinha, C. Tutty, S., et al. (2006). Pregnancy outcomes

in women who use opiates. *European Journal of Obstetrics Gynecology

and Reproductive Biology 126*(2), 170-175.

doi:10.1016/j.ejogrb.2005.08.010.

Farinde, A. (2017). Opioid use in middle-aged adults. *Clinical Advisor*. Retrieved

October 12, 2018, Retrieved from:

https://www.clinicaladvisor.com/commentary/opioidepidemic-in-middle

aged-adults/article/698422/#

Fentanyl. (n.d.). Retrieved from https://www.dea.gov/factsheets/fentanyl

Florence, C.S., Zhou, C., Luo, F., Xu, L. (2016). The economic burden of prescription opioid overdose, abuse, and dependence in the United States, 2013. *Medical Care, 54*(10), 901-906. doi: 10.1097/MLR.0000000000000625

Flynn, P. M., & Brown, B. S. (2008). Co-Occurring Disorders in Substance Abuse Treatment: Issues and Prospects. *Journal of Substance Abuse Treatment*, *34*(1), 36-47. http://doi.org/10.1016/j.jsat.2006.11.013

Glanz, K. & Rimer, B. (2005). Part 2. National Cancer Institute, National Institutes of Health, U.S. Department of Health and Human Services. NIH Pub. No. 97-3896. Theory at a Glance: A Guide for Health Promotion Practice (pp. 19-21). Washington, DC: NIH, Revised September 1997.

Grau, L. E., Dasgupta, N., Harvey, A. P., Irwin, K., Givens, A., Kinzly, M. L. & Heimer, R. (2007). Illicit use of opioids: Is OxyContin a "gateway drug"? *The American Journal on Addictions,16*(166-173). doi:10.1080/10550490701375293

Grey, C., & Hall, P. B. (2016). Considerations of prescription opioid abuse and misuse among older adults in West Virginia an under-recognized population at risk. *West Virginia Medical Journal*, *112*(3), 42. *Academic OneFile*, (accessed October 12, 2018).

Grogan, C. M., Andrews, C., Abraham, A., Humphreys, K., Pollack, H. A., Smith, B. T., & Friedmann, P. D. (2016). Survey highlights differences in Medicaid coverage for substance use treatment and opioid use disorder medications. *Health Affairs (Project Hope)*, *35*(12), 2289–2296. http://doi.org/10.1377/hlthaff.2016.0623

Gryczynski, J., Schwartz, R. P., Salkever, D. S., Mitchell, S. G., & Jaffe, J. H. (2011). Patterns in admission delays to outpatient methadone treatment in the United States. *Journal of Substance Abuse Treatment*, *41*(4), 431-439. http://doi.org/10.1016/j.jsat.2011.06.005

Han, B.H., Polydorou, S., Ferris, R., Blaum, C., Ross, S., & McNeely, J. (2015). New York University study finds adults aged 50-59 now largest age group in opioid treatment programs. New York University News. Retrieved from: https://www.nyu.edu/about/news-publications/news/2015/november/nyu study finds-adults-aged-50-59-now-largest-age-group-in-opioid-treatment programs.html

Hansen, H. (2017). Assisted technologies of social reproduction: pharmaceutical prosthesis for gender, race, and class in the white opioid "crisis". *Contemporary Drug Problems, 44*(4), 321-338.

Harvard School of Medicine. (2018). Coverage of medications that treat opioid use disorder and opioids for pain management in marketplace plans: Reports summarize opioids study results. *Mental Health Business Week*, *313*. Retrieved from:

http://link.galegroup.com.ezproxy.mtsu.edu/apps/doc/A552683122/AON
?u=te middleten&sid=AONE&xid=3ff1f172

Hasin, D. S., Stinson, F. S., Ogburn, E., & Grant, B. F. (2007). Prevalence,
Correlates, Disability, and Comorbidity of DSM-IV Alcohol Abuse and
Dependence in the United States. *Archives of General Psychiatry, 64*(7),
830. doi:10.1001/archpsyc.64.7.830

Hawk, K. F., Vaca, F. E., & D'Onofrio, G. (2015). Reducing fatal opioid overdose:
prevention, treatment and harm reduction strategies. *The Yale Journal of
Biology and Medicine*, *88*(3), 235–245.

Hedegaard H., Warner M., & Miniño, A. M. (2017). Hyattsville, MD: National
Center for Health Statistics.

Heinrich, C. J., & Cumming, G. R. (2014). Adoption and diffusion of evidence
based addiction medications in substance abuse treatment. *Health
Services Research, 49*(1), 27–152.

Hughes, A., Williams, M.R., Lipari, R.N., Bose, J., Copello, E.A.P., & Kroutil, L.A.
(2016). Prescription drug use and misuse in the United States: Results
from the 2015 National Survey on Drug Use and Health.
https://www.samhsa.gov/data/sites/default/files/NSDUH-FFR2
2015/NSDUHFFR2-2015.htm (accessed April 2, 2018).

Hutchinson, E., Catlin, M., Andrilla, C.H.A., Baldwin, L.M., & Rosenblatt, R.A. (2014). Barriers to primary care physicians prescribing buprenorphine. *Annals of Family Medicine, 12*(2), 128-133.

Jolley, C. J., Bell, J., Rafferty, G. F., Moxham, J., & Strang, J. (2015). Understanding heroin overdose: A study of the acute respiratory depressant effects of injected pharmaceutical heroin. *Plos One,10*(10). doi:10.1371/journal.pone.0140995

Jones, C.M., Lurie, P.G., & Throckmorton, D.C. (2016). Effect of US Drug Enforcement Administration's rescheduling of hydrocodone combination analgesic products on opioid analgesic prescribing. *Journal of Addiction Medicine Association Internal Medicine*. doi:10.1001/jamainternmed.2015.7799.

Jones, C. M., Campopiano, M., Baldwin, G., & McCance-Katz, E. (2015). National and State Treatment Need and Capacity for Opioid Agonist Medication-Assisted Treatment. *American Journal of Public Health*, *105*(8), 55-63. http://doi.org/10.2105/AJPH.2015.302664

Jones, C.M., Logan, J., Gladden, R.M., & Bohm, M.K. (2015). Vital signs: Demographic and substance use trends among heroin users in the United States, 2002-2013. *Morbidity and Mortality Weekly Report* 64(26), 719 725.

Johnston, S. S., Alexander, A. H., Masters, E. T., Mardekian, J., Semel, D., Malangone-Monaco, E., Sadosky, A. (2016). Costs and work loss burden of diagnosed opioid abuse among employees on workers compensation or short-term disability. *Journal of Occupational and Environmental Medicine, 58*(11), 1087-1097. doi:10.1097/jom.0000000000000865

Kennedy-Hendricks, A., Gielen, A., McDonald, E., McGinty, E.E., Shields, W., & Barry, C.L. (2016). Medication sharing, storage, and disposal practices for opioid medications among U.S. adults. *Journal of Addiction Medicine Association Internal Medicine 176*(7), 1027-1029.

Khadka, P. (2019). Socio-ecological model. Retrieved from https://bu.digication.com/GH720_PublicHealthTheories/Socio Ecological_Model

Khazan, O. (2017). The Link between Opioids and Unemployment. Retrieved from https://www.theatlantic.com/health/archive/2017/04/joblessness-and opioids/523281/

Kolodny, A., Courtwright, D.T., Hwang, C.S., Kreiner, P., Eadie, J.L., Clark, T.W., & Alexander, G.C. (2015). The prescription opioid and heroin crisis: A public health approach to an epidemic of addiction. *Annual Review of Public Health, 36*(559-574).

Kuehn, B.M. Substance Abuse and Mental Health Services Administration

    (SAMHSA). (2013). Pain Medication Abuse a Common Path to Heroin

    Experts Say This Pattern Likely Driving Heroin Resurgence. *Journal of*

    American Medical Association, 310(14), 1433-1434.

    doi:10.1001/jama.2013.278861

Larochelle, M.R., Zhang, F., Ross-Degnan, D., & Wharam, J.F. (2015). Rates of

    opioid dispensing and overdose after introduction of abuse-deterrent

    extended release oxycodone and withdrawal of propoxyphene. *Journal of*

    American Medical Association Internal Medicine, 175(6), 978-987.

Lawson, K. M., Back, S. E., Hartwell, K. J., Moran-Santa Maria, M., & Brady, K.

    T. (2013). A comparison of trauma profiles among individuals with

    prescription opioid, nicotine, or cocaine dependence. *The American*

    Journal on Addictions, *22*(2), 127-31.

Legal Action Center. (2015). Confronting an epidemic: The case for eliminating

    barriers to medication-assisted treatment of heroin and opioid addiction.

    Retrieved from: https://lac.org/wp-content/uploads/2014/07/LAC-The

    Case-for-Eliminating Barriers-to-Medication-Assisted-Treatment.pdf

Lipari, R., & Hughes, A. (2017). How people obtain the prescription pain

    relievers theymisuse. Center for Behavioral Health Statistics and Quality.

    Results from the 2015 National Survey on Drug Use and Health. Rockville

    (MD): Substance Abuse and Mental Health Services Administration (US);

    2013. Retrieved from: https://www.ncbi.nlm.nih.gov/books/NBK424785/

Lopez, G. (2017). There's a highly successful treatment for opioid addiction. But

stigmais holding it back. Retrieved from https://www.vox.com/science-and

health/2017/7/20/15937896/medication-assisted-treatment-methadone

buprenorphine-naltrexone

Lord, S., Brevard, J., & Budman, S. (2011). Connecting to young adults: An

online social network survey of beliefs and attitudes associated with

prescription opioid misuse among college students, *Substance Use &*

Misuse, 46(1), 66-76. doi:10.3109/10826084.2011.52137

Martins, S. S., Segura, L. E., Santaella-Tenorio, J., Perlmutter, A., Fenton, M. C.,

Cerdá, M., Hasin, D. S. (2017). Prescription opioid use disorder andheroin

use among youth nonmedical prescription opioid users from 2002 to

2014. *Addictive Behaviors*, *65*(236-241).

http://doi.org/10.1016/j.addbeh.2016.08.033

Mayo Clinic. (2017). Cognitive behavioral therapy. *Mayo Foundation for Medical*

Education and Research. Retrieved from: https://www.mayoclinic.org/tests

procedures/cognitive-behavioral-therapy/about/pac-20384610?p=1

McCabe, S. E., Cranford, J. A., Boyd, C. J., & Teter, C. J. (2007). Motives,

diversion and routes of administration associated with nonmedical use of

prescription opioids. *Addictive Behaviors*, *32*(3), 562–575.

http://doi.org/10.1016/j.addbeh.2006.05.022

McCarty, D., Braude, L., Lyman, D. R., Dougherty, R. H., Daniels, A. S., Ghose,

    S. S., & Delphin-Rittmon, M. E. (2014). Substance abuse intensive

    outpatient programs: assessing the evidence. *Psychiatric services*

    (Washington, D.C.), *65*(6), 718-26.

McClafferty, M. (2017). Adverse childhood experiences. *Encyclopedia of Public*

    Health Theories, 1-4. Boston, MA: Boston University School of Public

    Health.

McHugh, R. K., Hearon, B. A., & Otto, M. W. (2010). Cognitive-behavioral

    therapy for substance use disorders. *The Psychiatric Clinics of North*

    America, *33*(3), 511-525. http://doi.org/10.1016/j.psc.2010.04.012

McLeroy, K. R., Steckler, A., Bibeau, D. (Eds.) (1988). The social ecology of

    health promotion interventions. *Health Education Quarterly, 15*(4), 351

    377. Retrieved from:

    http://tamhsc.academia.edu/KennethMcLeroy/Papers/81901/An_Ecologi

    aPerspective_on_Health_Promotion_Programs

Mennis, J., & Stahler, G. J. (2016). Racial and ethnic disparities in outpatient

    substance use disorder treatment episode completion for different

    substances. *Journal of Substance Abuse Treatment, 63,* 25-33.

Mental Health and Substance Use Disorders. (2019, January 14). Retrieved from

    https://www.samhsa.gov/find-help/disorders

Mills, K. L, Teesson, M., Ross, J., Peters, L. (2006). Trauma, PTSD, and

    substance use disorders: Findings from the Australian National Survey of

    Mental Health and Well-Being. *American Journal of Psychiatry,163*(651-

    658).

Montgomery, D. C. (2017). *Design and analysis of experiments* (9th ed.), pp. 83

    Hoboken, NJ: John Wiley & Sons.

Montgomery, D. C. (2007). *Design and analysis of experiments* (6th ed.).

    Hoboken, NJ: John Wiley & Sons.

Muhuri, P., J. Gfroerer, & M.C. Davies. (2013). Associations of nonmedicalpain

    reliever use and initiation of heroin use in the United States. Center for

    Behavioral Health Statistics and Quality Data Review. Retrieved from:

    https://www.samhsa.gov/data/sites/default/files/DR006/DR006/no

    mealpanreliever-use-2013.htm

National Cancer Institute. (n.d.). Dictionary of cancer terms. Retrieved from

    https://www.cancer.gov/publications/dictionaries/cancer

    terms/def/morphine-sulfate

National Center for Injury Prevention and control, civision of violence

    prevention. (2016). About Adverse Childhood Experiences. Retrieved

    from: https://www.cdc.gov/violenceprevention/acestudy/about_ace.html

National Institute on Drug Abuse. (2018). Drugs, brains, and behavior: The

    Science of Addiction. Retrieved from

https://www.drugabuse.gov/publications/drugs-brainsbehavior-science
addiction

National Institute on Drug Abuse; National Institutes of Health; U.S. Department
of Health and Human Services. (2018). Heroin. Retrieved from:
https://www.drugabuse.gov/publications/drugfacts/heroin

National Institute on Drug Abuse. (2018). Opioids. Retrieved April 17, 2018, from
https://www.drugabuse.gov/drugs-abuse/opioids

National Institute on Drug Abuse. (2018). Principles of effective treatment.
Retrieved from: https://www.drugabuse.gov/publications/principles-drug
addiction-treatment-research-based-guide-third-edition/principles-effective
treatment-research-based-guide-third-edition

National Institute on Drug Abuse. (2018). Principles of drug addiction treatment:
A Research-Based Guide (Third Edition). Retrieved from:
https://www.drugabuse.gov/publications/principles-drug-addiction
treatment-research-based-guide-third-edition

National Institute on Drug Abuse. (2018). Treatment approaches for drug
addiction. Retrieved from:
https://www.drugabuse.gov/publications/drugfacts/treatment approaches
drug addiction on 2018, August 28

National Institute on Drug Abuse; National Institutes of Health; U.S. Department
of Health and Human Services. (2018). Abuse of prescription (Rx) drugs

affects young adults the most. Retrieved from:

https://www.drugabuse.gov/relatedtopics/trends

statistics/infographics/abuse-prescription-rx-drugs-affects-young

adults-most.

National Institute on Drug Abuse. (2018). Heroin. Retrieved from

https://www.drugabuse.gov/publications/research-reports/heroin on 2019,

April 8

National Institute on Drug Abuse; National Institutes of Health; U.S. Department

of Health and Human Services. (2016). Understanding drug use and

addiction. Retrieved from: http://www.drugabuse.gov

National Institute on Drug Abuse. (2015). Substance use in women. Retrieved

from: https://www.drugabuse.gov/publications/drugfacts/substance-use-in

women

National Institute on Drug Addiction. (2014). Drugs, brains, and behavior: the

science of addiction. Retrieved from:

https://www.drugabuse.gov/publications/drugs-brains-behavior-science

addiction

National Institute on Drug Addiction. (2014). Opioid overdose crisis. Retrieved

from: https://www.drugabuse.gov/drugs-abuse/opioids/opioid-overdose

crisis

National Institutes of Health. (2018). Healing Heal Addiction Long-term (HEAL)

Initiative Research Plan. 9000 Rockville Pike, Bethesda, Maryland 20892.

Retrieved from: https://www.nih.gov/researchtraining/medical-research

initiatives/heal-initiative/heal-initiative-researchplan#references

National Survey on Drug Use and Health. (2015). Behavioral health trends in the

United States: Results from the 2014 National Survey on Drug Use and

Health.

Office of Women's Health. (2017). Final Report: opioid use, misuse, and

overdose in Women. Retrieved August 25, 2018, from

https://www.womenshealth.gov/files/documents/final-report-opioid-508.pdf

Olsen, Y., & Sharfstein, J. M. (2014). Confronting the stigma of opioid use

disorder and its treatment. *Journal of American Medical Association*,

311(14), 1393-1394.

Opioid Treatment Program (OTP) Accreditation. (2018, November 14). Retrieved

from

https://www.jointcommission.org/facts_opioid_treatment_program_otp_a

creditation/

Oxford University Press. (n.d.). Counselling | Definition of counselling in English

by Oxford Dictionaries. Retrieved from

https://en.oxforddictionaries.com/definition/counselling

Pasternak, G. W, & Pan, Y. X. (2013). Mu opioids and their receptors: Evolution

of a concept. *Pharmacological Reviews*, *65*(4) 1257-1317; DOI:

https://doi.org/10.1124/pr.112.007138

Patrick, S. W., Schumacher, R.E., Benneyworth, B. D., Krans, E. E., McAllister,

J. M., & Davis M. M. (2012). Neonatal abstinence syndrome and

associated health care expenditures: United States, 2000-2009. *Journal of*

the American Medical Association, 307(18), 1934-1940.

Prewitt, E. (2017). Trauma and ACEs Missing Response to Opioid Crisis, Says

National Organization. Retrieved December 30, 2018, from

http://acetoohigh.com/2017/08/03/trauma-and-aces-missing-in-response

to-opioid-crisis-says-national-organization/

Rinaldo, S.G., Rinaldo, D.W. (2013). Advancing access to addiction medications:

implications for opioid addiction treatment. *American Society of Addiction*

Medicine. Retrieved from: https://www.asam.org/docs/default

source/advocacy/aaam_implications-for-opioid-addiction

treatment_final.pdf?sfvrsn=cee262c2_25

Ringold, S., Lynm, C., & Glass, R. M. (2006). Alcohol abuse and

alcoholism. *Journal of American Medical Association, 295*(17),

doi:10.1001/jama.295.17.2100

Rudd R. A., Seth P., David, F., & Scholl, L. (2016). Increases in drug and opioid involved overdose deaths in the United States, 2010–2015. *Morbidity and Mortality Weekly Report, 16* ePub. doi.org/10.15585/mmwr.mm655051e1

Saffier, K., Colombo, C., Brown, D., Mundt, M., & Fleming, M. (2007). Addiction Severity Index in a chronic pain sample receiving opioid therapy. *Journal of Substance Abuse Treatment*, *33*(3), 303-311.

Saloner, B., & Cook, B. L. (2013). Blacks and Hispanics are less likely than whites to complete addiction treatment, largely due to socioeconomic factors. *Health Affairs, 32*(1), 135-145. doi:10.1377/hlthaff.2011.0983

Sansone, R. A., Whitecar, P., Widerman, M. W. (2009). The prevalence of childhood trauma among those seeking buprenorphine treatment. *Journal of Addictive Diseases, 28*(1), 64-67.

Schrager, A. (2015). What's killing white, middle-aged women in America? *Quartz*. Retrieved from: http://qz.com/552760/why-are-white-middle-aged women-dyingin-america/

Schwartz, R.P., Gryczynski, J., O'Grady, K.E. (2013). Opioid agonist treatments and heroin overdose deaths in Baltimore, Maryland, 1995-2009. *American Journal of Public Health, 103*, 917-922

Sigmon, S.C. (2014). Access to treatment for opioid dependence in rural America: challenges and future directions. *Journal of American Medical Association Psychiatry*, *71*(4), 359-360.

Smith, P. H., Homish, G. G., Leonard, K. E., & Cornelius, J. R. (2012). Intimate

partner violence and specific substance use disorders: Findings from the

National Epidemiologic Survey on Alcohol and Related

Conditions. Psychology of Addictive Behaviors: *Journal of the Society of*

Psychologists in Addictive Behaviors, *26*(2), 10. 1037/a0024855.

http://doi.org/10.1037/a0024855

Social Security Administration. (n.d.). Medicaid Information. Retrieved from

https://www.ssa.gov/disabilityresearch/wi/medicaid.htm

Substance Abuse and Mental Health Services Administration. (2018).

Adverse childhood experiences. Retrieved from:

https://www.samhsa.gov/capt/practicing-effective-prevention/prevention

behavioral-health/adverse-childhood-experiences

Substance Abuse and Mental Health Services Administration. (2017). Key

substance use and mental health indicators in the United States: Results

from the 2016 National Survey on Drug Use and Health (HHS Publication

No. SMA 17-5044, NSDUH Series H-52). Rockville, MD: Center for

Behavioral Health Statistics and Quality, Substance Abuse and Mental

Health Services Administration. Retrieved from:

https://www.samhsa.gov/data/

Substance Abuse and Mental Health Services Administration. (2017). Opioid use

in the older adult population. *Resource List, 1*(1). Retrieved from:

https://www.samhsa.gov/capt/sites/default/files/resources/resources

opiod-use-older-adult-pop.pdf

Substance Abuse and Mental Health Services Administration. (2016). Advancing

the care of pregnant and parenting women with opioid disorder and their

infants: A foundation for clinical guidance. Rockville, MD: Substance

Abuse and Mental Health Services Administration.

Substance Abuse and Mental Health Services Administration. (2016). Decisions

in recovery: medications for opioid use disorder. HHS Pub No. SMA-16

4993. Retrieved from: http://www.samhsa.gov/brsstacs/shared-decision

making

Substance Abuse and Mental Health Services Administration; Office of the

Surgeon General. (2016). Facing Addiction in America: The Surgeon

General's Report on Alcohol, Drugs, and Health [Internet]. Washington,

D.C.: US Department of Health and Human Services; Nov. Chapter 1,

Introduction and Overview of the Report. Retrieved from:

https://www.ncbi.nlm.nih.gov/books/NBK424860/

Substance Abuse and Mental Health Services Administration (2016). Medication

Assisted Treatment (MAT) Support Organizations. Retrieved from:

http://www.samhsa.gov/medication-assisted-treatment/training

resources/support-organizations; and National Council for Behavioral

Health, letter to SAMHSA, May 26, 2016,

http://www.thenationalcouncil.org/wpcontent/uploads/2016/05/ NPRM

Medication-Assisted-Treatment-2.pdf

Substance Abuse and Mental Health Service Administration (2015). Approved

opioid treatment accrediting bodies. Retrieved from:

https://www.samhsa.gov/medication-assisted-treatment/opioid-treatment

accrediting-bodies/approved

Substance Abuse and Mental Health Services Administration. (2015).

Buprenorphine. Retrieved from https://www.samhsa.gov/medication

assisted-treatment/treatment/buprenorphine

Substance Abuse and Mental Health Services Administration. (2015). Medication

and counseling treatment. Retrieved from:

https://www.samhsa.gov/medication-assisted-treatment/treatment

Substance Abuse and Mental Health Services Administration. (2015). National

Survey of Substance Abuse Treatment Services (N-SSATS): 2014. Data

on Substance Abuse Treatment Facilities. Behavioral Health Services

Information System Series S-79, HHS Publication No. (SMA) 16, 4963.

Rockville, MD: Substance Abuse and Mental Health Services

Administration.

Substance Abuse and Mental Health Services Administration (SAMHSA). (2015).

National Survey on Drug Use and Health (NSDUH). Table 5.6A

Substance use disorder in past year among persons aged 18 or older, by

demographic characteristics: Numbers in thousands, 2014 and 2015.

Retrieved from: https://www.samhsa.gov/data/sites/default/files/NSDUH

DetTabs-2015/NSDUH-DetTabs-2015/NSDUH-DetTabs-2015.htm#tab5

6a

Substance Abuse and Mental Health Services Administration (SAMHSA). 2015

National Survey on Drug Use and Health (NSDUH). Table 5.6B

Substance use disorder in past year among persons aged 18 or older, by

demographic characteristics: Percentages, 2014 and 2015. Retrieved

from: https://www.samhsa.gov/data/sites/default/files/NSDUH-DetTabs

2015/NSDUH-DetTabs-2015/NSDUH-DetTabs-2015.htm#tab5-6b.

Tabachnick, B. G., & Fidell, L. S. (2013). *Using multivariate statistics (6th ed.).*
Boston, MA: Pearson.

The Center for Medicaid and Chip Services, Centers for Disease Control and

Prevention, Substance Abuse and Mental Health Services Administration,

National Institute on Drug Abuse, National Institutes of Health, National

Institute on Alcohol Abuse and Alcoholism, & National Institutes of Health.

(2014). Informational bulletin: Medication-assisted treatment for substance

use disorders. Retrieved from: https://www.medicaid.gov/federal-policy

guidance/downloads/cib-07-11-2014.pdf

The Joint Commission (2017). Facts about Opioid Treatment Program (OTP)

accreditation. (2017, December 8). Retrieved from:

https://www.jointcommission.org/facts_opioid_treatment_program_otp_a

creditaion/

U.S. Department of Health and Human Services. (2013). Addressing prescription

drug abuse in the United States: Current activities and future

opportunities. Retrieved from: https://www.cdc.gov/drugoverdose/pdf/hhs_

prescription_drug_abuse_report_09.2013.pdf

United States Department of Health and Human Services, National Institutes of

Health, National Institute of Mental Health. (2012). Principles of drug

addiction treatment: A research-based guide. *National Institute on Health*

Publication No. 12-4180. Retrieved from:

https://www.drugabuse.gov/publications/principles-drug-addicition

treatment-research-based-guide-third-edition/frequently-asked

questions/what-are-unique-needs-women-substance-use

United States Department of Health and Human Services, National Institutes of

Health, National Institute of Mental Health, National Institute on Health.

(2012). Principles of drug addiction treatment: A research-based

guide. *National Institute on Health* (Third Edition), No.12-4180, p. 15.

United States Department of Justice, National Drug Intelligence Center. (2011).

National drug threat assessment.

www.justice.gov/archive/ndic/pubs44/44849/44849p.pdf

Volkow, N. D., Koob, G. F., & Mclellan, A. T. (2016). Neurobiologic advances

from the brain disease model of addiction. *New England Journal of

Medicine, 374*(4), 363-371. doi:10.1056/nejmra1511480

Volkow, N.D, (2014). Harnessing the power of science to inform substance

abuse and addiction policy and practice. *National Institute on Drug

Addiction.* Retrieved from: https://www.drugabuse.gov/about

nida/legislative/activities/testimony-to-congress/2014/harnessing-power

science-to-inform-substance-abuse-addiction-policy-practice

Volkow, N. D., Frieden, T. R., Hyde, P. S., & Cha, S. S. (2014). Medication

assisted therapies tackling the opioid-overdose epidemic. *The New

England Journal of Medicine, 370*(22), 2063-2066. Retrieved from:

https://ezproxy.mtsu.edu:3443/login?url=https://search.proquest.com/doc

ew/130407043?accountid=4886

Volkow, N. D., & Muenke, M. (2012). The genetics of addiction. *Human

Genetics, 131*(6), 773-777. doi:10.1007/s00439-012-1173-3.

What is Cognitive Behavior Therapy | Beck Institute. (n.d.). Retrieved from

https://beckinstitute.org/get-informed/what-is-cognitive-therapy/

Wang, K. H., Becker, W. C., Fiellin, D. A. (2013). Prevalence and correlates for

nonmedical use of prescription opioids among urban and rural residents.

*Drug and Alcohol Dependence, 127(*156-162).

Warner, M., L.H. Chen, D.M. Makuc, R.N. Anderson, & Minino, A.M. (2011). Drug

poisoning deaths in the United States,1980-2008. Retrieved from:

https://www.cdc.gov/nchs/products/databriefs/db81.htm

Webster, L. R., Cochella, S., Dasgupta, N., Fakata, K. L., Fine, P. G., Fishman,

S. M., Grey, T., Johnson, E.M., Lee, L. K., Passik, S. D., Peppin, J.,

Porucznik, C. A., Ray, A., Schnoll, S. H., Richard L. Stieg, R. L., &

Wakeland, W. (2011). An analysis of the root causes for opioid-related

overdose deaths in the United States, *Pain Medicine*, *12*(2), 1, S26

S35. https://doi.org/10.1111/j.1526 4637.2011.01134.x

What is SUBOXONE Film? (n.d.). Retrieved from

https://www.suboxone.com/treatment/suboxone-film

World Health Organization. (2009). Guidelines for the psychosocially assisted

pharmacological treatment of opioid dependence. Geneva: World Health

Organization. http://www.who.int/iris/handle/10665/43948

World Health Organization. (1992). International statistical classification of

diseases and related health problems.10th Revision. Geneva: WHO.

WHO. 1990. Draft of chapter V: mental and behavioural disorders. Clinical

descriptions and diagnostic guidelines. *International Classification of

Diseases.* 10th Revision. Geneva.

Xuyi, W., Juelu, W., Xiaojun, X., Haiyan, L., Zheyuan, L., Zhehui, G., & Wei, H.

(2014). Phase I study of injectable, depot naltrexone for the relapse

prevention treatment of opioid dependence. *American Journal on Addiction,* 2(162).

APPENDICES

APPENDIX A: SPATIAL DEPENDENCY MORAN'S I

Moran's I is on a scale from -1 to 1. A value of -1 means a perfectly negative spatial relationship, meaning a county is likely to have the opposite value of its neighboring counties. A value of 0 means there is no spatial relationship, that is nearby counties have no relationship with one another on the specific variable. A value of 1 means there is a perfectly positive relationship, meaning a county is more likely to have a similar value as its neighbors.

Variable	Moran's I
Poverty rate	0.5843
Unemployment rate	0.6117
Employment to population ratio	0.1401
Per capita retail opioid sales	0.4303
Per capita Medicare Part D opioid prescriptions	0.2208
Opioid-related hospitalization rate	0.4594
Drug overdose death rate	0.4944

Note: All estimates are statistically significant, p <0.001. Estimates for Poverty rate, Unemployment rate, retail opioid sales, Medicare Part D opioid prescriptions are for 2016. The estimate for the employment to-population ratio is for 2015. The estimate for opioid-related hospitalization rates is for 2014.

APPENDIX B: GLOSSARY OF TERMS, ABBREVIATIONS, AND ACRONYMS

ACA	Affordable Care Act
ACASI	Audio Computer-Assisted Self-Interview
ADHD	Attention Deficit Hyperactivity Disorder
AMI	Any Mental Illness
ASI	Addiction Severity Index
ASMA	American Society of Addiction Medicine
CAI	Computer-Assisted Interview
CARF	Commission on Accreditation of Rehabilitation Facilities
CATI	Computer-Assisted Telephone Interview
CBT	Cognitive Behavioral Therapy
CDC	Center for Disease Control and Prevention
COD	Co-Occurring Disorder
DATA 2000	Drug Addiction Treatment Act
DEA	Drug Enforcement Agency
DSM-5	Diagnostic Statistical Manual (5th ed)
DU	Dwelling Unit

DWP	DATA 2000 Waived Physician
FDA	Food and Drug Administration
FI	Field Interview
HOI	Half Open Interval
JCAHCO	Joint Commission
MAT	Medication Assisted Therapy
MCO	Managed care organization
NA	Narcotics Anonymous
NAS	Neonatal Syndrome
NCBH	National Council for Behavioral Health
NIDA	National Institute on Drug Addiction
NSDUH	National Survey on Drug Use and Health
N-SSATS	National Survey on Substance Abuse Treatment Services
OBOT	Office-based opioid treatment
ONDCP	Office of National Drug Control Policy
OUD	Opioid use disorder
OWH	Office of Women's Health
PTSD	Post Traumatic Stress Disorder

RFC   Request for Proposal

SAMHSA   Substance Abuse and Mental Health Services Administration

SAMHSA's   I-BHS Inventory of Behavioral Health Services

SCT   Social Cognitive Theory

WHODAS   World Health Organization Disability Assessment Schedule

WHONDCP   White House Office of National Drug Control Policy

APPENDIX C: NATIONAL SURVEY ON DRUG USE AND HEALTH

(NSDUH 2016)

Questions from the NSDUH 2016

Independent variable.

Received alcohol or drug treatment in the past 12 months?

Received mental health treatment in the past 12 months?

Dependent variable.

# of days of current opioid use in the past 1-30?

Control variables.

1. Covered by any health insurance?

2. Past 12 months, worked at any job?

3. Age

   1 = 12-17 Years Old

   2 = 18-25 Years Old

   3 = 26-34 Years Old

   4 = 35-49 Years Old

   5 = 50-64 Years Old

   6 = 65 or Older

4. Gender

    1. Male

    2. Female

5. Race/Ethnicity

    1 = Non-Hispanic White

    2 = Non-Hispanic Black/African American

    3 = Non-Hispanic Native American/Alaskan Native

    4 = Non-Hispanic Native Hawaiian/Other Pacific Islander

    5 = Non-Hispanic Asian

    6 = Non-Hispanic more than one race

    7 = Hispanic