

Sarah Lawrence College

DigitalCommons@SarahLawrence

Dance/Movement Therapy Theses

Dance/Movement Therapy Graduate Program

5-2020

**Stronger Together: A Case For Partnering Dance/Movement
Therapy and Medically Assisted Treatment For A Comprehensive
Embodied Approach To The Opioid Crisis**

Jayann Chipman

Follow this and additional works at: https://digitalcommons.slc.edu/dmt_etd



Part of the [Dance Commons](#), and the [Dance Movement Therapy Commons](#)

STRONGER TOGETHER: A CASE FOR PARTNERING DANCE/MOVEMENT THERAPY
AND MEDICALLY ASSISTED TREATMENT FOR A COMPREHENSIVE EMBODIED
APPROACH TO THE OPIOID CRISIS.

Jayann Chipman

May 2020

Submitted in partial fulfillment
of the requirements for the degree of
Master of Science in Dance/movement therapy
Sarah Lawrence College

ABSTRACT

An estimated 2.1 million people in the US are estimated to have opioid use disorder. Medically assisted treatment as an approach utilizes medication, counseling, and group therapy for treatment of opioid use disorder and increases the effectiveness of other therapeutic interventions. It has positive effects on treatment retention, and doubles the probability that an individual will one day achieve abstinence. Medically assisted treatment addresses physical symptoms of withdrawal, but it does not include the embodied experience. Dance/movement therapy addresses the multilevel human experience in an approach to wellness.

Dance/movement therapy as a bidirectional modality uses movement and body-mind connectivity to promote the integration of the emotional, social, cognitive and physical self to improve health and wellbeing.

Keywords: dance/movement therapy, medically assisted treatment, mind-body pathway, neuroplasticity, substance abuse, opioid use disorder, addiction treatment

ACKNOWLEDGMENTS

I would like to express my sincere thanks and gratitude to my thesis advisors, Susan Orkand and Elise Risher, for providing invaluable wisdom, attention to detail, and continuous guidance throughout the course of this project. I would specially like to thank Susan Orkand for her enthusiasm and for helping to distill my swirling concepts into clear ideas and Elise Risher for her patience, for motivating me, and for showing me how to use the comma.

Thank you to Alma, Nada, and all of the professors of the dance/movement therapy program at Sarah Lawrence College for their commitment throughout our education, for sharing themselves with us, and for modeling compassion. I have so much respect for their capability to adapt to the ever changing landscape of the pandemic which altered our course. I want to say a special thank you to Jennifer Lemiech-Iervolino who, from the very beginning, was always willing to lend an ear. Also, thank you to Liz Commisso, Charlotte Stephenson, and Brent Parker, for their flexibility regarding demands of my classes, thesis research, and internship schedule. And to all and all folks in the Swinford Annex thank you for making me feel at home, especially Rita Mastroberardino who provided me with many snacks.

I would like to offer to my classmates and future colleagues my thanks and deep appreciation for challenging me and for their passion, fire, and sensitivity. It has been an honor to learn and grow with this group of powerful and dynamic women who are true forces for change. I am excited for what the future holds for each of us.

Thank you to my internship supervisor, Caitlin Kelly, for listening to all my ideas and for holding space for all of the possibilities of the future. And thank you to Jenn Moskowitz, with

whom I had the privilege of working daily in my internship, for encouraging me, providing me with space to discover, and for answering so very many of my questions.

Finally I would like to express my love and appreciation for my family and friends who encouraged me to follow my dreams. To my parents, Jerry and Sheila, for caring for my dogs and letting me store my life in their basement for the last two years. To my brother, Joel, who reminded me that I had the freedom to take this chance and of whom I am so proud. To my Aunt Martee who has always believed in me. And, to my best friend Lara Gallagher, who inspires me to be courageous, thoughtful, and to dream.

DEDICATION

This work is dedicated to the women under whom I studied in the University of Montana Dance Program, Nicole Bradley-Browning, Amy Ragsdale, Michele Antonioli, Heidi Jones-Eggert, Karen Kaufman, and Heather Adams. It was in their presence that I experienced the transformative power of dance which changed my life, and ultimately led me here. They embraced me as I was, a 23 year old non-dancer, and allowed me to immerse myself in a community of thoughtful, expressive, powerful movers who inspire me every day. Words cannot express my eternal gratitude to them for sharing with me the gift of dance.

TABLE OF CONTENTS

ABSTRACT	iii
ACKNOWLEDGEMENTS	iv
DEDICATION	vi
Introduction	1
Multidimensional Effect of Opioids	4
Treatments for Opioid Use Disorder	12
Multidimensional Effect of Dance and Dance/Movement Therapy	22
Dance/Movement Therapy in Addiction Treatment	29
Discussion	37
Conclusion	40
References	42

Opioids are nondiscriminatory. They affect users regardless of sex, age, gender, race, ethnicity, socio-economic, or socio-cultural status. The National Institutes of Health (2019) report that 21-29% of the patients who are prescribed opioids end up abusing them. Of these, eight to 12% develop opioid use disorder, and four to six per cent of those will transition to heroin. Use disorder is a condition which is considered to be a chronic lifelong disruption of normal physical or mental functioning with serious potential for consequences including disability, relapses, and death (American Psychiatric Association, 2013). In 2017, according to the Centers for Disease Control, 57.8% out of 100 people received new opioid prescriptions (U.S. Opioid Prescribing Rate Maps, 2018). This number is down significantly from its peak in 2012, but it still illustrates a staggering amount (191,218,272) of new prescriptions. Approximately 2.1 million people in the US are estimated to have opioid use disorder (Yerby, 2019).

Opiate is a term referring to morphine, a naturally occurring substance derived from the opium poppy plant (Brick and Erickson, 1998). The term opioid originally described man made drugs which were chemically similar to opiates. Today the term opioid is applied more broadly to include all substances - naturally occurring, semi-synthetic, and synthetic - that have similar effects as morphine (Brick and Erickson, 1998). Opioids have been used for their medicinal effects for thousands of years, but it is within the last 30 years that opioid addiction in the United States has skyrocketed. From 1999 to 2017, 399,230 people in the US lost their lives to opioids (Yerby 2019). In 2017 alone, 47,600 deaths (67.8% of all drug overdose related deaths) involved opioids (Scholl, Seth, Kariisa, Wilson, Baldwin, 2019). The prevalence of opioid use has been recognized as a national crisis with effects on public health, social and economic welfare, and increased costs to the judicial and medical systems.

Booth (2013) traces the recreational cultivation of opium poppies back to Mesopotamia, 3400 BC. It is not until 1525 AD that a written account by Jerome of Brunswick identifies the sedative qualities of opiates in surgical use. For thousands of years, the most basic raw form of an opioid was used recreationally and medicinally by humankind. It was not until 1803, almost 300 years after the first mention of its surgical use, that morphine was isolated and identified by Sertürner as the clinically important derivative of the opium poppy plant (Booth, 2013). Sertürner's discovery and subsequent experimentation paved the way for the prescription of morphine for pain relief in the 1800's. Production of synthetic opioids, including heroin (which was first celebrated as a safe and less addictive alternative to morphine), began. Once it was realized that natural and manmade opioids had severe addictive qualities, strict regulations were implemented to mitigate the perceived danger (Rummans et al., 2018). The United States signed the International Opium Convention in 1912 and instituted the Heroin Act in 1924, both of which were designed to address rising addiction rates and to regulate the use of synthetic and natural opioids as a matter of public safety (Rummans et al., 2018). Despite known risks and instituted laws, abuse of opioids persisted, production of new synthetic opioids continued to be explored, and opioids were still viewed as the preferred prescription method for acute pain management (Rummans et al., 2018).

It was not until the mid-1990's that a sharp increase in the prescription rate of opioids occurred. The beginning of this phenomenon is traced to a letter written in 1980 to the editors of the *New England Journal of Medicine* (Rummans et al., 2018; Leung et al., 2017). The authors criticized opioid restrictions for pain management and claimed that of over 11,882 patients; only four had become addicted to opioids (Porter and Jick, 1980). This information directly contradicted previous findings that opioids were highly addictive. The letter was subsequently

cited over 600 times in favor for expanded capability to prescribe opioids for pain (Rumanns et al., 2018; Leung, Macdonald et al., 2018). The next fifteen years saw a slow but steady expansion of opioid prescription rates and a broadening of the applications to include treatment of chronic pain (Rumanns et al., 2018). In 1995, further influence came in the form of an address by Dr. James Campbell to the American Pain Society (Morone & Weiner, 2013). With concerns that pain was undermanaged, he urged health care providers to regard pain as an important clinical measurement, the presence of which impacted quality of life. Dr. Campbell advocated for increased inquiry of pain which led to increased reporting. Before this time, pain assessment was not a regular consideration. After his address, however, the practice of evaluating pain was widely adopted, which evoked a reaction by physicians to provide treatment, particularly treatment which included increased rates in opioid prescribing (Morone & Weiner, 2013). The rapid expansion in the prescription of opioids was also pushed for by pharmaceutical companies. In the 1990's pharmaceutical companies promised that newly developed semi-synthetic and synthetic opioids were much safer and that, unlike morphine or heroin, their use held little danger for addiction (Opioid Overdose Crisis, January 2019). These claims were somewhat deceptive in nature and this is attributed to the fact that there were no federal or industry guidelines at that time (United States General Accounting Office, 2003). As an example, OxyContin was aggressively marketed as a safe and suitable medication to treat long-term chronic pain with few side effects, a false claim which eventually led to a fine of \$634.5 million (Rumanns et al., 2018). The mid to late 1990's saw a culmination of these events: a poorly founded claim which was widely cited and potentially misinterpreted, the idea of pain as vital to health being relatively new and the reaction to provide care, and finally pharmaceutical companies engaging in deceptive marketing practices. Overall prescriptions for opioids increased

by two to three million each year between 1990 and 1995 (Rumanns et al., 2018). Following the marketing push, annual prescriptions for OxyContin alone increased from 920,000 in 1997 to 7.2 million 2002 and in the same six year period the total number of opioid prescriptions increased by 45 million (United States. General Accounting Office, 2003; Rumanns et al., 2018).

When taken as prescribed, opioids are effective for pain management; however, when taken incorrectly there is a high potential for abuse. Throughout the course of this paper I will use the terms use, abuse, addiction, and use disorder when referring to opioid consumption. Use will be defined as consumption as intended. As opioids are a controlled substance, their intended purpose is application according to a prescription obtained through a medical professional. Abuse will be defined as consumption of prescription opioids in a manner other than prescribed, or consumption of illegal opioids (heroin) and continuing to do either despite harmful or detrimental effects. Continued abuse can lead to addiction or use disorder. These two terms are used interchangeably throughout this paper and they are defined as the compulsion to continue abuse, to be overwhelmingly involved in obtaining and consuming opioids with resulting palpable and noticeable effect on daily life, and the inability to prioritize well-being over continued consumption.

Multidimensional Effect of Opioids

The Diagnostic and Statistical Manual of Mental Disorders describes opioid use disorder as “a problematic pattern of opioid use leading to clinically significant impairment or distress” (American Psychiatric Association, 2013, p. 541). Diagnosis of opioid use disorder, according to the DSM-5, requires two or more criteria that reflect impaired health or function over the course of 12 months. Included in the diagnostic criteria are behavioral, physiological, and physical

changes. This is significant because it suggests that opioid use disorder requires a multidimensional understanding that considers the effects on the mind as well as the tangible and intangible effects on the body.

There are many perspectives on why drug abuse occurs. Lewis (2015) argues that, viewed through the lens of neurobiology, addiction could be considered an extreme reaction of a normally functioning brain engaging in neuroplasticity. Neuroplasticity is a process in which the brain is constantly engaging in which it learns, adapts, and changes. The neurobiological perspective on addiction argues that long term exposure to opioids creates long term changes in different neural systems (Beltran-Campos et al., 2015). Opioids affect the user by altering the way the brain functions. They have been prescribed for centuries for their sedative and intoxicating affects, for pain management, and even as antidepressants. It was not until 1973 that scientists discovered specific receptors within the central nervous system to which opioids bind. According to Brick and Erickson (1998), it was the discovery of opioid specific receptors which led to the discovery of naturally occurring endogenous (occurring inside of the body) opioids known collectively as endorphins. Endorphins are part of the body's natural response to pain; pain stimuli cause endorphins to flood the brain, bind with receptors, and provide pain relief (Brick and Erickson, 1999). Further research led to the discovery of additional receptors which are present throughout the central and peripheral nervous system; the primary opioid receptors are mu (μ), kappa (κ), and delta (δ) (Leppä et al., 2006). While exogenous and endogenous opioids work through the excitation of opioid receptors throughout the body, mu (μ) is the opioid receptor that is the most responsive to the analgesic and intoxicating effects of exogenous opioids (Brick and Erickson, 1998). In other words, it is only through excitation of these mu receptors that opioids such as morphine, heroin, oxycodone, and codeine (among others) exert

their pain relieving effects as well as their stimulating effects. In addition to the clinical benefits of pain management, a significant dose of opioids can induce feelings of intense euphoria (Savvas, 2013). These opioid induced alterations of the human system are also identifiable within minutes after they enter the circulatory system (Brick and Erickson, 1998). The euphoric feeling caused by exogenous opioids is much more intense than the endogenous opioids and this is what is both so enticing and dangerous about their use. It was this discovery that illuminated why the body has a very specific response to exogenous (occurring outside of the body) opioids; they mimic naturally occurring chemical processes in the body (Brick and Erickson, 1998; Does Long-Term Opiate Use Change the Brain? 2018).

Opioids are classified as psychoactive drugs, chemical substances that change brain functioning resulting in temporary alterations in mood, consciousness, perception, cognition, or behavior (Brick and Erickson, 1998). The specific impact on neurobiological processes is drug and drug use dependent (Koob et al., 1998). This means different drugs, such as, alcohol, tobacco, ecstasy, cannabis, and opioids affect the brain in different, but specific, ways. Criteria in the Diagnostic and Statistical Manual of Mental Disorders factors in inter-individual biological variability, which means that no two people taking a drug will have exactly the same response to the drug (Brick and Erickson, 1998). The criteria is expansive enough to account for varying symptoms demarcating opioid abuse, but not all people who misuse opioids will fit the abuse profile. Keeping in mind this possibility for variability, there are many hallmarks specific to opioid use and abuse which present neurologically, behaviorally, physically, and emotionally.

With opioid use several, areas of the limbic system (the brains center for processing emotions) in the brain are indicated including the hypothalamus, the amygdala, the cortico frontal cingulate system, and the mesolimbic dopamine system (Savvas, 2013; Berrol, 1992).

The mesolimbic dopamine system, also known as the reward pathway, projects from the ventral tegmental area in the midbrain to the ventral striatum of the basal ganglia in the forebrain (Savvas, 2013). When the brain receives stimuli identified with a reward, the mesolimbic dopamine system is activated; dopamine floods the brain and facilitates feelings of pleasure and satisfaction (Does Long-Term Opiate Use Change the Brain? 2018). This is noteworthy because the reward pathway is involved in identifying cues and facilitating reinforcement in reward-related learning and because of this it is believed to play a central role in the development and maintenance of addiction (Koob et al., 1998). With opioids, the brain learns to identify feelings of euphoria that are associated with opioid use as a reward. Any action which would lead to this reward (such as turning down the street toward the dealer's house) would be the cue which triggers the reward pathway. Once triggered, the release of dopamine induces feelings of pleasure or satisfaction and the result is reinforcement of the drug seeking activity. Through the process of reinforcement, the reward pathway encourages addiction.

The brain consists of innumerable neuro synaptic pathways which are like a basic wiring network (Lewis, 2015). These networks play a vital part in the action of neuroplasticity. For example, walking a dog stimulates an established pathway in the brain and, each time this activity is performed, the same pathway is activated. A new experience, such as feelings of euphoria while taking opioids, can spark a new pathway, and it is the development of these new pathways which prompt structural change in the brain's wiring network. When the same pathway is accessed repeatedly and is positively reinforced by dopamine, dopamine enhances formation of the new pathway so that pathway is more deeply engrained (Lewis, 1999). The more deeply engrained a pathway, the more firmly it is established as a procedure and eventually it becomes habitual. This process occurs most significantly in the ventral striatum, which is the area

responsible for motivation in pursuing rewards. With reinforcement, the newly established pathway consolidates until there is a well-defined circuit for that reward. A healthy brain is constantly engaging in this adaptive process of developing new circuitry, however, with opioid abuse, long term exposure results in persistent reorganization of neuro synaptic connections (Beltran-Campos et al., 2015). The new pathways that are created are strong and deeply engrained and this makes them difficult to alter, which is counter to the action of neuroplasticity. The result is the brain adapts to a very specific way of operating and is less capable of change. As long term abuse affect synaptic neuroplasticity, it also diminishes dendritic spines (Beltran-Campos et al., 2015). Dendritic spines aid in synaptic communication and are thought to play a vital role in cognition as well as the reception of dopamine (Lewis, 2015). As they diminish, the structure of the receptors which absorb dopamine become less effective. While the pathways related to opioid abuse become entrenched, other pathways become weaker and gray matter as well as synaptic density, in these now underutilized areas diminishes (Lewis, 2015). As the brain becomes more singularly focused on opioid reward, previously enjoyed activities, like playing with children or walking the dog, no longer hold as much value in comparison, and engagement in these activities is neglected or stops. Here is the root of many of the behavioral changes present with opioid abuse.

Behavioral changes which are indicative of opioid abuse may be difficult to notice in the early stages, but they become more pronounced over time (Mayo Clinic Staff, 2018). These changes may include regularly taking opioids in a manner other than prescribed, such as taking a larger dose than prescribed or taking opioids for the way they make a person feel, stocking up on medications to prevent running out, taking medications “just in case” when pain is not present, or taking medications specifically to avoid symptoms of withdrawal (Brick and Erickson, 1998;

Mayo Clinic Staff, 2018). Individuals may engage in drug seeking behaviors, including attempting to procure duplicate prescriptions from multiple sources, borrowing medication, or claiming to have lost prescriptions in order to stock up. Changes may also include altered sleep patterns, mood changes, including excessive mood swings from excitement to belligerence, utilizing poor judgement including engaging in dangerous situations or putting oneself or others in harm's way, and impaired sensory and motor skills (Brick and Erickson, 1998; Mayo clinic staff, 2018). In examining the neurobiological effects of opioid use, it is clear that behavior changes are congruent with changes within the brain, as opposed to separate conscious choices.

In opioid use disorder, behavioral changes escalate to include loss of control over consumption even when there are physical or psychosocial consequences (Beltran-Campos et al., 2015). Dependence, tolerance, and withdrawal are factors which contribute to this loss (Savvas, 2013). These require careful consideration because they manifest both neurologically and physically and, in doing so, have an effect on the emotional and behavioral changes which present. The abovementioned euphoria is by itself, a positively reinforcing factor for opioid abuse. With continued abuse, the brain builds tolerance, which causes a reduction in the pleasurable feelings that accompany use (Potenza et al., 2011). Physical dependence begins with tolerance, which is when the brain is no longer responding to opioids the way it first did. As a result, higher doses must be taken in order to reach the same level of euphoria. There is a direct correlation between dose size and tolerance level: as one increases, so does the other.

Tolerance to opioids can grow quite quickly (Does Long-Term Opiate Use Change the Brain? 2018). The brain acclimates to exogenous opioids, requiring increased dosages to achieve the same analgesic or euphoric effects. As tolerance increases, the brain reduces its own production of endogenous opioids as it has come to depend on the administration of exogenous

opioids (Does Long-Term Opiate Use Change the Brain? 2018). This is the brain's naturally adaptive response; the brain comes to rely on this drug to function. When the drug-dependent brain is deprived of the exogenous opioid it has become accustomed to, the brain experiences withdrawal (Koob, Sanna, Bloom, 1998). Withdrawal is the physical and psychological response which occurs when the brain has acclimated to a certain level of exogenous opioids and those are no longer present. In withdrawal, endogenous opioids have lost their efficacy, as a chemical change to the reward function of the brains means the system is no longer able to regulate itself (Does Long-Term Opiate Use Change the Brain? 2018). The inability to regulate is a component that makes withdrawal mentally difficult because brain functioning has been chemically altered. Alternating episodes of euphoria and withdrawal provide both positive and negative reinforcement which contribute to continued abuse (Does Long-Term Opiate Use Change the Brain? 2018.) In time, pleasant motivations driving opioid use diminish while the negative motivations increase and the behavior becomes less about reward (Potenza et al., 2011). Dependence is now both physical and psychological and the adaptive response of the brain means that behavior transforms from intentional to habitual and eventually to compulsive.

In addition to neurological and behavioral changes, opioid abuse also has physical effects, and tolerance, dependence, and withdrawal play a big part. Physical responses to opioid use can include decreased pulse rate and/or body temperature, constricted pupils, slowed reflexes and stupor (Brick and Erickson, 1998). Speech may be slowed, low, raspy, or slurred, memory and attention are impaired, and skin can be cool to the touch (Brick and Erickson, 1998). Also possible are respiratory depression, constipation, nausea, vertigo, and drowsiness or sedation (Savvas, 2013). First time users may experience some of these symptoms, such as intense nausea or vertigo, which will decrease with prolonged exposure, while abuse can result in coma or death

(Brick and Erickson, 1998). Just as tolerance increases with adaptations in the brain, tolerance for many of the physical aspects of use also increases. Tolerance for pain relief, nausea and respiratory depression rise, while only a limited increase in tolerance is seen for pupillary restriction and constipation (Savvas, 2013). With even short-term use, symptoms of withdrawal can present (Brick and Erickson, 1998). The physical presentation of withdrawal can be similar to an intense bout of influenza (Brick and Erickson, 1998). Common symptoms include insomnia, weakness, irritability, aches and pains, runny nose, chills, sweating, agitation, and anxiety. In the later stages of withdrawal symptoms might include nausea, goosebumps, dilated pupils, and abdominal cramps, or diarrhea. Savvas (2013) adds shaking and watery eyes to the list of withdrawal considerations. Higher tolerance and greater dependence also mean increased severity in withdrawal symptoms (Brick and Erickson, 1998). Intense negative physical feelings are a component that makes withdrawal painful and also physically difficult because the opioid dependent brain is no longer properly producing endorphins for pain management. With long term abuse, the positive effects of opioids, such as euphoria and pain management, are no longer the driving force behind use. In the case of abuse, compulsive actions reinforced by reward and pleasure are continuously compounded by the threat of increasingly painful and intense withdrawal symptoms.

The release of endogenous opioids in a stressful situation helps to regulate mood by creating feelings of relaxation and increasing the sense of wellbeing (Does Long-Term Opiate Use Change the Brain? 2018). As stated above, dopamine plays a significant part in the emotional response brought on by external cues in reward seeking activities. Studies show that emotional response is modulated by the endogenous opioid system (Leppä et al., 2006). Animal studies show that opioids are implicated in changing emotional states and also in modifying

emotional reactivity (Savvas, 2013). Savvas (2013) clarifies that emotional reactivity is the emotional response to external stimuli while emotional states are the emotional response to internal stimuli. As the functionality of the endogenous opioid system is usurped by exogenous opioids, it follows that there will also be an effect on emotions.

Opioids have been prescribed as antidepressants and have mood enhancing properties that have been shown to reduce stress; however, persons with opioid dependence rate higher on measures of anger, depression, fatigue, anxiety, and confusion (Savvas, 2013) A person who is experiencing stress or irritation who uses opioids can experience a boost to their emotional state while the opioid's endorphin-like action is experienced, but, after the effects wear off, negative emotional states return quickly. These negative emotional states are a powerful motivator which factor into compulsive opioid abuse (Koob et al., 1998). With abuse, the reduction of functioning in the mesolimbic dopamine system causes emotional reactivity to be blunted. This includes both elative and depressive reactivity and has consequences which extend to social and psychological functioning (Savvas, 2013). The blunting effect of opioid abuse on emotional reactivity means less access to a full range of emotions is available for reaction and emotional processing.

Treatments for Opioid Use Disorder

Just as there are different perspectives on factors leading to substance abuse, there are also differing ideas of what treatment should look like. One treatment perspective is abstinence only, in which substance users are encouraged to refrain from substance use. In the case of opioid dependence, the detoxification process includes painful withdrawal symptoms and, for this reason this method doesn't have a high rate of success (National Institutes of Health, 2019). The concept of ego fatigue is also something of note as it highlights the all or nothing approach that is

central to abstinence and how taxing that process can be (Lewis, 2015). The idea here is the more an object is withheld, the more the object is desired. Resistance as the primary focus in substance abuse means focus and energy are put toward refraining from the object instead of reframing the object. In individuals who have recently detoxified by abstaining, there is also a loss of tolerance (Connery 2015). When relapse occurs with lowered tolerance, these individuals are particularly susceptible to increased risk of overdose and death.

Another perspective to treatment is use of therapy or counseling which examines the “why” of substance abuse. Two different approaches using this type of approach are substance abuse as response to affect intolerance and substance abuse as a transitional object. Affect intolerance is viewed as dealing with persistent inability to master emotions through substance abuse (Johnson, 1999). A person who lacks the capability to regulate emotions imbibes the substance as a means of external modulation. As opioids have mood stabilizing effects, this approach might suggest opioid abuse is to reduce stress. The perspective of addiction as transitional object suggests that addiction is the response when there is a lack of, or an inability to utilize, internal or external relationships (Johnson, 1999). In this case, the individual might have insufficient or poor relationships and substance abuse becomes a substitute for having needs met. The substance also acts as a constant object when relationships are unfulfilling or unstable. Again, due to mood stabilizing effects, this approach might suggest that the positive feelings associated with opioid abuse are a substitute for positive feelings in relationships. Both of these approaches focus on identifying and resolving psychosocial problems which may be influencing abuse. Once identified, problem thoughts and behaviors, high-risk circumstances, and triggers can be resolved (Tinkler, Vallejos Bartlett, Brooks, Gilbert, Henderson, Shuman, 2005). The idea here is, through learning and integration of information, alterations can be made to patterns of behavior, which

can lead to changes in perspective, reinterpretation of emotional states, and development of control. Learning about personalized factors and motivations, as well as examining individual roots of addiction, also has positive effects on neuroplasticity (Lewis, 2015). This suggests that positive neurological changes are a secondary benefit to the self-examination and learning process. However, while addressing psychosocial factors by raising self-awareness, providing insight to the client about their influences and motivations, and developing coping skills is a critical step, these treatment perspectives don't focus much on the neurological and physical disruptions that are a part of opioid dependence.

The pharmacotherapy perspective addresses neurological and physical disruptions of opioid dependence through medication. Pharmacotherapy interventions interrupt the cycle of opioid use which is maintained due to alterations to motivational neurocircuitry (Potenza et al., 2011; Does Long-Term Opiate Use Change the Brain?, 2018). This is achieved through introduction of medications to normalize the chemical disruptions in the brain (Kosten, 2002).

There are two types of medication used to treat opioid abuse: either antagonist (naltrexone) or partial agonist (methadone or buprenorphine) (Potenza et al., 2011). Naltrexone is an antagonist, or opioid blocker, which binds to the mu receptors and, instead of stimulating, it prevents activation (Connery, 2015). Unlike agonist and partial agonist medications, it does not have risks of euphoria, withdrawal, or abuse (Kosten, 2002). Naltrexone works by binding to mu receptors to prevent activation of the reward system; however, it provides no relief from withdrawal (Kosten, 2002). Preventing all activation of the reward system means that, on the one hand exogenous opioids will have no effect, but on the other endogenous opioids will also have no effect. Additionally, before Naltrexone can be administered it requires total detoxification from all agonist and partial agonist opioids and it is this, in combination with painful withdrawal

symptoms, that makes administration and compliance poor (Kosten, 2002). A better option is partial agonist medication. Partial agonist medications, methadone and buprenorphine, are opioids themselves, which means they do have potentiality for euphoria, withdrawal, and abuse (National Institutes of Health, 2019; Medications to Treat Opioid Use Disorder, n.d.). Similar to the mu agonist opioids (morphine, heroin, oxycodone), partial agonists activate mu receptors in the brain but they occupy these receptors for a longer period of time and with much less intensity (Connery, 2015). The medication acts as a stabilizing tool to intervene immediately and to control or diminish withdrawal and craving (Connery, 2015). Partial agonists satisfy the brain's increased need for opioid stimulation and provide a substitution when exogenous opioids are absent and endogenous opioids are insufficient. Additionally, the use of partial agonists in treatment also prevents a dramatic drop in physical tolerance. This is important because, in cases of relapse when tolerance is tapered instead of dramatically reduced, there is a lower risk of overdose and death (Connery, 2015).

The administration of long acting partial agonists with lower levels of psychoactive effects allows for mitigation of the harmful effects of agonist opioids and it gives the brain a break. As the brain is experiencing a reprieve from the cycle of abuse and withdrawal, recovery of synaptic plasticity can occur (Beltran-Campos et al., 2015). This suggests an opportunity for a resetting of the brain, allowing for healing and reengagement in the action of neuroplasticity which is disrupted in long-term opioid abuse. After detoxification, the chemical alterations to the brain which influence dependence and addiction begin to resolve, but this is a long process which might take months or years (Kosten, 2002). The clinical effects of partial-agonist and antagonist medication also differ for individuals (Connery, 2015). So, just as inter-individual biological

variability factors into opioid effects, the effects of pharmacotherapy in treatment and recovery vary from person to person.

Pharmacotherapy treatments are highly effective, but given the complex effects of opioid use disorder, the most pragmatic approach is to work in tandem with psychosocial treatments (Kosten, 2002). Just as opioids affect the user on multiple levels, it follows that treatment needs to be multidimensional to address the effects of opioids on the whole person. According to the National Institute on Drug Abuse, medically assisted treatment is a “critical component of opioid addiction treatment” with scientific research establishing that medically assisted treatment “increases patient retention and decreases drug use, infectious disease transmission, and criminal activity.” (Olsen and Sharfstein, 2014, p. 1393). Studies show the most success in opioid use disorder treatment has been found to come from pharmacotherapy combined with psychosocial interventions, behavioral therapies, and mindfulness-based therapies (Connery, 2015; Potenza et al. 2011).

The term medically assisted treatment describes an approach which utilizes medication, counseling, and group therapy for treatment of opioid use disorder (Does Long-Term Opiate Use Change the Brain?, 2018). Ideally, it involves a multidisciplinary team including physicians, counselors, nurses, case managers, social workers, and the client (Tinkler et al., 2005). As opioid dependence treatment is client-specific, the client is a vital member of their treatment team. This is important because participation in a medically assisted treatment program is voluntary, and the inclusion of the client in their own treatment increases their engagement as well as adherence to treatment (Tinkler et al., 2005). This combination of modalities creates a simultaneous top-down and bottom-up approach which allows for treatment of the whole person. While pharmacotherapy addresses the neurological and physical, psychotherapeutic interventions are

used to bring awareness to, and shift behavior from, unhealthy to healthy. Ultimately, the goal of these combined interventions is to seize a window of opportunity in which the client's withdrawal symptoms are comfortably and safely managed and therapeutic interventions can be implemented to develop sustained motivation to avoid relapse.

Comprehensive medically assisted treatment increases the effectiveness of other therapeutic interventions, has significant positive effects on treatment retention, and doubles the probability that an individual will one day achieve abstinence (Connery, 2015). Increased instances of abstinence not only benefit the client, they have a positive influence on the societal cost as well. In 2013, the total estimated social cost of prescription opioid use disorders (criminal justice, incarceration, opioid dependent infants, treatment of infectious diseases, overdose treatment, intoxication injuries, and loss of productivity including unemployment) was \$78 billion with only 3.6% (\$2.8 billion) attributed to treatment (National Institutes of Health, 2019). Increased retention in medically assisted treatment programs is shown to have outcomes of lower depression, increased positive health outcomes, improved overdose mortality rate, reduced HIV risk, reduced drug seeking behavior, reduced involvement in criminal activity, improved employment retention, and improved psychosocial relations (Savvas, 2013; National Institutes of Health, 2019). Weighing the societal costs of opioid abuse against the benefits of treatment for the individual and society as a whole, it is clear that comprehensive treatment with the highest positive outcomes for patient wellbeing has an overall benefit to society. Medically assisted treatment plays a vital role in improving quality of life for those with opioid use disorder (Potenza et al., 2011). Recovery involves learning new habits and methods of coping, but it also must address the issues of possible relapse and help to prepare the individual who must learn new strategies when facing cravings and social pressure to use (Potenza et al., 2011).

Medically assisted treatment shows the highest rate of success and is supported by the World Health Organization, the Substance Abuse and Mental Health Services Administration, and the Institute of Medicine (Olsen and Sharfstein, 2014). However, there are many challenges to implementing medically assisted treatment programs, including assumptions and misconceptions, personal bias, stigmatization, situational barriers, and cost (National Institutes of Health, 2019; Connors et al., 2013; Connery, 2015; Olsen and Sharfstein, 2014; Lewis, 2015; Savvas, 2013). Many of these factors also overlap with one another, which compounds the difficulty of obtaining and maintaining treatment.

There are many assumptions and misconceptions about medically assisted treatment which prevents widespread implementation and these assumptions have largely to do with the medications used. While the clinical effects of partial agonists are lower than agonist opioids, the fact that they are all opioids leads to the assumption that medically assisted treatment is simply replacing one drug with another; if individuals are engaging in long-term medically assisted treatment using partial agonists then they are not actually in recovery. Lack of understanding for the neurological and physical need for medically assisted treatment has slowed its adoption. Treatment providers who share these views might be reluctant to prescribe this treatment, might push for patients to exit or taper treatment too soon, or may administer treatment incorrectly (Connery, 2015; National Institutes of Health, 2019). This then fuels the ill-formed misconception that medically assisted treatment is ineffective. Olsen and Sharfstein (2014) speak also of the misconception that a person who has opioid use disorder can control their cravings; relapses are really just choices that are indicative of weak character. The perception that weakness and willpower of the individual are the biggest factors in abstinence enforces an “us versus them” mindset in which the blame for use is placed completely on the individual (Olsen

and Sharfstein, 2014). If the client is minimized in this manner, there is a possibility of creating an untrusting environment which encourages dishonesty for fear of stigmatization. This again stems from lack of understanding the need for medically assisted treatment and also highlights possible personal biases toward those suffering from opioid use disorder. The result is that, ultimately, access to effective care is limited and patients who would otherwise benefit from treatment are harmed.

Stigmatization of opioid use disorder is another significant barrier to treatment (Olsen and Sharfstein, 2014). This leads to opioid use disorder rarely being treated alongside mental illness or medical disorders, and not being of equally valued as part of psychological wellness. This point of view ignores factors of physical and neurological dependence and historically has distanced opioid abuse treatment from the rest of health care (Olsen and Sharfstein, 2014). This separation means that substance abuse, physical health, and mental health are not weighed equally. If primary focus is on mental health, then opioid abuse becomes secondary. When this happens, the whole person is segmented into manageable pieces which are assigned priority. For individuals with co-occurring diagnosis, there is danger that symptoms of opioid abuse may be falsely attributed to mental health and vice versa. This can add to stigma, might minimize the problem, and results in inadequate treatment.

Currently the World Health Organization recognizes access to medically assisted treatment as a necessary part of healthcare (National Institutes of Health, 2019). While there has been awareness of opioid abuse since the early 1900s, it was not until 2005 that partial agonist drugs were added to the World Health Organization's list of essential medications which should be readily available and affordable as a standard part of healthcare (National Institutes of Health, 2019). This recognition has not been enough to overcome the misconceptions, stigma, and bias

which prevent access to a scientifically supported treatment. In fact, by 2013, 50% of drug courts still did not allow medically assisted treatment under any circumstances (National Institutes of Health, 2019). This is why a greater understanding of opioid use disorder as a medical disorder is necessary; the view that treatment using partial agonist medication is opioid abuse continues to prevent access.

There are situational barriers to medically assisted treatment which also affect widespread implementation and access. Both methadone and buprenorphine are controlled substances, which means they must be delivered within a federally regulated treatment program (Connery, 2015). While there are federal guidelines in place which dictate their implementation, fewer than half of private-sector programs offer this modality and, within those programs, less than a third of eligible patients receive it (Connors et al, 2013, National Institutes of Health, 2019). This shows a clear pattern of underutilization which shines a light on the problems that occur with limited access. In early treatment, daily maintenance dosing is required to mitigate withdrawal symptoms (Connery, 2015). This is an easy task with an inpatient population but, for individuals who are responsible for bringing themselves to a treatment facility for maintenance dosing, challenges with transportation, location, and scheduling could add to the burden of accessing treatment.

Barriers also differ for different portions of the population. For example, members of the military experience a higher rate of use and abuse of opioids (National Institutes of Health, 2019). This often happens because opioids are used in treatment of depression, posttraumatic stress disorder, chronic pain, and are also abused in instances of high stress. The Veterans Health Association does acknowledge partial agonist medications as the first line of treatment in opioid use disorder, but only a quarter of patients are recorded as participating in these programs

(National Institutes of Health, 2019). For incarcerated populations, historically, access has been limited or sometimes prohibited by the judicial system (Olsen and Sharfstein, 2014). In 2015, the Office of National Drug Control Policy dictated that state drug courts which receive federal grants must not deny individuals access to treatment programs using partial agonist medications and must not mandate that an individual cease use of prescribed partial agonist medications as a condition of court (National Institutes of Health, 2019). This is especially important as incarceration carries its own stigma. Denial or lack of access to medically assisted treatment programs forces incarcerated individuals struggling with opioid use disorder to detox painfully. In a situation where individuals have been stripped of much of their human rights, this practice turns detoxification into an additional punishment. Individuals without access to these programs while incarcerated have a twelve times higher fatality rate linked to loss of tolerance upon release and relapse, higher reincarceration rates, higher return to criminal activity, and higher instances of risky behavior contributing to instances of HIV, and hepatitis B and C (Olsen and Sharfstein, 2014; National Institutes of Health, 2019). Incarcerated persons with access to medically assisted treatment while incarcerated are shown to have the highest engagement in treatment (National Institutes of Health, 2019). According to the National Institutes of Health (2019), 68.6% of these individuals enter community-based medically assisted treatment programs post release while only 7.8% of individuals who receive counseling while incarcerated and a referral post incarceration to a medically assisted treatment program participate. The numbers show that earlier engagement in treatment increases the likelihood of continued participation and success. One month after release, 27.6% of those who had access to medically assisted treatment test positive for illicit opioids compared to 62.9% of those who received only

counseling and 41% of those who received counseling and referral (National Institutes of Health, 2019).

Language which is currently used to describe aspects of opioid use disorder treatment can be potentially stigmatizing or pejorative (Olsen and Sharfstein, 2014). Terms like junkie carry weight and imply character judgement. Hopefully, junkie isn't a term used in the treatment setting, but in the case of clients using partial agonists, test results showing the presence of opioids are labeled as positive. Labeling these results positive or negative is not that far from labeling them dirty or clean; terms which also imply a value judgement. The term detoxification, with or without medically assisted treatment, implies that as long as opioids are detectable in the system, a person is toxic (Olsen and Sharfstein, 2014). Similarly, saying a person is "getting healthy" indicates that while in recovery, they are not healthy (Olsen and Sharfstein, 2014). Lewis (2015) further observes that even the word recovery carries negative connotations. Recovery implies trying to go back to a place or to get back what we've lost. Treating neurological, physical, and psychological changes resulting from opioid use disorder involves embodied development into a new place of understanding. Therefore, especially in healing spaces, language should be carefully considered in its capacity to mirror or perpetuate stereotypes.

Multidimensional Effect of Dance and Dance/Movement Therapy

Movement is universal to all human beings and is defined as physical motion between points in space. Capability, mobility, and expression may vary widely, but even in stillness there is movement: in breath, in the beating of the heart, and in the tiny dance that is the in constant negotiation with gravity. Dance can be defined as a sequence of intentionally organized,

culturally patterned movement, which is performed in a specific order to rhythmic stimuli. Dance has been utilized by humankind for countless centuries for socialization and communication as well as for healing of mind (enhancing expression and emotional release), body (for fertility, birth, sickness, and death), and soul (religious and spiritual celebration) (Quiroga Murcia et al., 2010; Jeong et al., 2005; Ritter, and Low, 1996; Rossberg-Gempton and Poole, 1992). Dance can be presentational, interactive, for physical exercise, improvisational, or done as a solo activity. Dance can exist in many forms including performative, social, solo, and structured partner dance. When dance and movement are examined closely, there are many benefits including physical, psychological, emotional, and neurological.

Movement in physical activities, such as exercise, often has a focus on health benefits such as improved physical fitness (Hui et al., 2008). Exercise is comprised of motoric movements which are completed for a specific purpose, but movement in dance incorporates dynamic aspects of movement simultaneously for full body engagement. An example of the intentional marriage of dance and exercise for physical health is aerobic dance. Aerobic dance can be any kind of dance done to music in a choreographed sequence of movements for the purpose of improving cardiovascular and muscular health. Studies documenting the benefits of aerobic dance observe numerous physical benefits including increases in cardiorespiratory endurance, coordination, and dynamic balance, as well as decreased body fat, lowered resting heart rate, and lowered blood pressure (Hui et al., 2008). It is clear that there are many physical benefits which are observed in this form of intentional movement. Studies also show psychological benefits in aerobic dance including improved self-esteem, improved mood, and increased social contact (Hui et al., 2008). This is noteworthy because psychological benefits,

while identifiable, are not the primary focus of this type of movement as physical health is the goal.

As a multidimensional activity, dance is effective in improving physical, emotional, and psychological health. Of note are studies on social and structured partner dance forms which show many of the same benefits to physical health as aerobic dance, but also demonstrate increased focus on psychological and emotional aspects (Hui et al., 2008; Quiroga Murcia et al., 2010; Hackney et al., 2007; Kiepe et al., 2012). Emotional benefits include reductions in anxiety, negative thoughts and feelings, and stress (Quiroga Murcia et al., 2010). Quiroga Murcia (2010) reported significant improvements to emotional states in the time leading up to dance interactions which remained after the activity had ceased. This suggests long lasting changes to emotional states in relation to dance. Psychological benefits of dance include increased sense of self-worth, increased mental well-being, and improved sense of belonging (Quiroga Murcia et al., 2010). Increased sense of belonging may be attributed to the relational nature of social and structured partner dance. As an example, structured partner dances, such as tango, involve physical interaction, as movement is in direct relation to another body (Hui et al., 2008; Hackney et al., 2007). In addition to engagement through dynamic balance, variations in speed, and spatial awareness, tango requires close proximity and joining rhythmically with another person. Rhythmicity supports connection and strengthens social bonds, while encouraging sympathy and understanding both individually and culturally (Quiroga Murcia et al., 2010). This development of relationships expands social networks and builds community by providing the opportunity for connection, encouragement, and the experience of external support systems, all of which have correlating positive emotional and psychological effects.

While there are numerous physical, psychological, and emotional benefits which result from movement and dance, there are also neurological indications to consider. Long term dance training, for example, shows increased brain activity and increased gray and white matter in the brain (Karpati et al., 2015). Studies comparing brain activity of professional dancers to non-dancers, and those comparing repetitive movement to dance interventions in non-dancers found increased gray and white matter in the participants who were engaging through dance (Karpati et al., 2015; Rehfeld et al., 2018; Müller et al., 2017; Teixeira-Machado et al., 2019). These studies indicate structural change to the brain as a direct byproduct of dance. In addition to structural change, functional changes are observed, including increased balance, significant improvement in memory, increased attention, and improved psychosocial factors (Teixeira-Machado et al., 2019). Taken together, these structural and functional changes comprise the essence of neuroplasticity.

A key facilitator in neuroplasticity is brain-derived neurotrophic factor, a protein which is secreted in the central nervous system (Mang et al., 2013; Müller et al., 2017; Dayan, and Cohen, 2011; Rehfeld et al., 2018, Dayan and Cohen, 2011). It plays a vital role in neuroplasticity and neurogenesis by assisting dendritic spines growth and by facilitating persistent strengthening of synapses (Mang et al., 2013). Brain-derived neurotrophic factor is secreted in one of two ways: continuously, regardless of external influence, or in response to activity (Mang et al., 2013). This means that its role in the action of neuroplasticity can be directly affected through movement. Studies which compare repetitive movements, such as exercise, to dance and their efficacy on neuroplasticity, indicate that dance has greater influence (Müller et al., 2017; Teixeira-Machado et al., 2019). This suggests that type of movement plays an important part. Dance as a multi-sensory activity incorporates ever changing steps, rhythms, coordination of multi-bodily

expression, and requires learning (Müller et al., 2017). The evolving nature of dance allows for full sensory engagement through the body to integrate several brain functions simultaneously.

Movement is the core component of both dance and dance/movement therapy so it follows that benefits of movement and dance are inherent to dance/movement therapy (Kiepe et al., 2012). The defining difference is the transactional relationship between the trained dance/movement therapist and the client. This relationship is the key piece through which facilitation of understanding of the multidimensional relationship between mind and body occurs. Dance/movement therapy is a bidirectional modality, body to mind/mind to body, that uses movement and body-mind connectivity to promote the integration of the emotional, social, cognitive and physical self to improve health and wellbeing.

Early dance/movement therapists such as Trudi Schoop, Marian Chace, and Liljan Espanek believed in the reciprocal relationship between mind and body (Rossberg-Gempton and Poole, 1992). Schoop viewed the body as the tangible expression of man's lived experience and believed that alterations to the physical would manifest in the cognitive. Chace explored nonverbal expression in treatment and noted that patients who had psychological barriers affecting communication used the body to communicate. Espanek promoted the body and self-expression through movement as a way to gain knowledge of the self (Rossberg-Gempton and Poole, 1992). Dance/movement therapy's core tenet is what happens in the mind is reflected in the body and what happens in the body is reflected in the mind. This focus on the body-mind connection is not singular to dance/movement therapy. Early explorations of the reciprocal relationship between the body and affect can be traced to Charles Darwin (Rossberg-Gempton and Poole, 1992). Darwin suggested that movement was expressive of states of mind. This idea has been explored and expanded by psychoanalysts, psychologists, and dance/movement

therapists alike who have studied the relationships between movement and emotional access/expression, postural shifts, body positioning, muscular tension, facial expression, and gesture, and what information these all convey. Throughout the 1900s, researchers observed positive correlation between the mind and body and concluded that movement provided valuable diagnostic information pertaining to emotional and psychological wellbeing. In recent years, developments within neuroscience have begun to illuminate this connection more clearly (Homann, 2010; Rossberg-Gempton and Poole, 1992). This is of significance because verification of the body-mind link aids in understanding why a body based approach is valuable and effective as a mechanism of change.

Participants in dance/movement therapy report positive psychological changes including improved quality of life, self-esteem, mood, and affect, with reductions in paranoid ideation, anxiety, psychological distress, and psychoticism (Ritter and Low, 1996; Kiepe et al., 2012; Jeong et al., 2005; Koch et al., 2013 cited in Acolin, 2016). These are examples of impacts on psychological function, which are achieved by engagement of the brain through the body (Berrol, 2006). In addition to the psychological, dance/movement therapy demonstrates behavioral, emotional, and neurological applications (Ritter and Low, 1996; Kiepe et al., 2012; Jeong et al., 2005; Acolin, 2016). Following are three examples which each list an intervention with a primary goal. Please note that, because dance is a multisensory engagement, these interventions have multiple applications. The first example is of neurological significance. Kiepe et al., (2012) and Acolin, (2016) observed that interventions using dance/movement therapy in people with depression showed an increase in neurohormones which play a role in stabilizations of the sympathetic nervous system. Here is a measured positive neurological effect of dance/movement therapy. The second example is of emotion. Dance/movement therapy work

with mildly depressed adolescents showed modulating effects on dopamine and serotonin levels, including stabilization of the sympathetic nervous system and increased relaxation (Jeong et al., 2005). As noted earlier, dopamine plays a vital role in the reward systems of the brain; therefore, this indicates correlating effects on mood. The final example is of behavior. Movement and rhythm used in a group process encourage entrainment, or synchronization, with the group, which when achieved, fosters a sense of becoming part of a collective (Berrol, 1992). This joining in rhythm strengthens interpersonal communication and expands nonverbal communication. Combined, these examples demonstrate tangible clear additional benefits to dance/movement therapy which come from development of the therapeutic relationship, and its role in supportive processing of embodied experience.

Dance/movement therapy is also used in the management of chronic pain. Acute, short term pain is an important signal that alerts the individual to stress or injury. Chronic pain is long term, lasting weeks or years, which can be detrimental to work, behavior, social relationships, and mental health (Shiel, 2018; Boudreau et al., 2010). Chronic pain is an important factor to consider when working with people with opioid use disorder. Conventional pain management strategies, including increased prescribing rates of opioids, have contributed to the current opioid epidemic and this means there is a good chance that pain will be a compounding factor in the treatment of opioid use disorder. Quiroga Murica et al., (2010) observed that dance was useful in both pain reduction and in accepting physical impairments. Further study by Shim, Goodill, and Bradt (2019) examined multiple dance/movement therapy interventions for chronic pain and identified five key mechanisms that were beneficial in treatment: activating self-agency, connecting to others, connecting to self, reframing, and enhancing emotional wellness. Participants of the study identified that the most important feature of dance/movement therapy

was the nonjudgmental space which allowed for self-directed structure (Shim, Goodill, and Bradt, 2019). Left unaddressed, chronic pain reduces movement, causes detachment, and limits capability to engage in life in a meaningful way (Shim et al., 2019). There are many studies on the use of dance/movement therapy as an effective tool for management of chronic pain which are outside the scope of this paper.

Dance/Movement Therapy in Addiction Treatment

The holistic perspective on treatment of opioid use disorder includes considerations of emotional, physical, and social wellbeing (Breslin et al., 2003). As a psychotherapeutic modality, dance/movement therapy uses the body to address emotional and psychological effects of opioid abuse including fear, control, denial, anger, ambivalence, loss, and shame (Milliken 1990, 2008). This kinesthetic exploration through the body includes engagement of not only the physical, but neurological aspects as well. Dance/movement therapists who have knowledge of the multidimensional effects of opioid use disorder bring enhanced awareness of what the client may be experiencing and how the body-mind pathway has been affected. They engage the whole client in their individual expression and make room for the varying manifestations of addiction. Critical components to their engagement are knowledge of the hallmarks of opioid abuse as well as careful attention paid to countertransference (Thomson, 1997). It is important for the dance/movement therapist to have knowledge both about themselves in relation to opioid use disorder and of the functioning of opioid use disorder. Knowledge allows for increased insight and distinguishing whether reactions are due to characteristics of the individual or to aspects of the disorder. This is important because the individual is not the disorder and stigma surrounding

opioid abuse sometimes detracts from this fact. An example of this might be a dance/movement therapist working with a client to grow emotional expression using movement intervention to expand the kinesphere. In this case, awareness of the emotionally blunting effects of opioids increases the awareness that what might look like resistance on the part of the client who is having difficulty connecting emotionally, is really a side effect of opioid abuse or pharmacotherapy treatment.

Dance/movement therapy holds an important space in treatment for co-occurring diagnosis. In instances of dual diagnosis, it is common that substance abuse is treated as a secondary concern. This is problematic because concurrent opioid abuse and psychological disorder may exacerbate each other or have interrelated symptoms (Thomas, 1997). Dividing the person in a way which positions mental health as more important, results in the inability to differentiate what is a symptom and what is an effect. An example would be a person who experiences a traumatic event which results in posttraumatic stress disorder and is prescribed opioids for pain management. The calming effect and euphoric feelings received from opioid use have become preferential to negative emotional states, and opioid abuse becomes an element. In this example, if the psychological components of posttraumatic stress disorder are viewed as the important pieces of the puzzle, attention to abuse is lessened, manifestations of withdrawal are minimized, and symptoms such as agitation or self-destructive behaviors may be falsely attributed to posttraumatic stress disorder when they are really indicative of physical and psychological dependence. The result is that necessary parts of the person are missed. Dance/movement therapy creates an environment which allows the body to be experienced alongside the mind and sheds light on the complete picture. Awareness of physical manifestations of pain and opioid addiction as well as specialized knowledge of movement and

patterning of the body makes dance/movement therapists uniquely poised to identify and advocate for co-occurring substance abuse as equally important to psychological health (Kirane, 2018). By combining knowledge of hallmarks of opioid abuse and attuning to the embodied experience, dance/movement therapists identify and become voices for the whole human being.

Dance/movement therapy brings with it all of the possible creative elements of dance and expressive movement (Thomson, 1997). As an artistic expression, dance is unique because of its transitional nature; it lives only in the moment that it exists, the here and now. Naturally, it follows that, as a modality, dance/movement therapy reflects the present moment (Kirane, 2018). What is happening emotionally, psychologically, and physically is all simultaneously present in the space. When opioid abuse has taken the individual outside of their own recognition or their body out of their control, dance/movement therapy is a vehicle that can bring them back to right now by reacquainting them with the physical. This involves rediscovering the natural sensations or signals that come from the body (Breslin et al., 2003). Raising conscious perception of what is occurring in the body stimulates identification of sensations that have been blocked or distorted by opioid abuse. Bringing awareness to the present moment, or grounding, is achieved through intentional focus on the physical to give context to the body in space. Interventions can use sensory awareness (use of sight, smell, hearing, touch, and taste) or physical action. Intentional eye contact, weight sensing, use of the kinesphere (personal space), or use of space (external environment) are all possibilities (Thomson, 1997). A sensory exercise which stimulates the five senses requires the individual to pay attention to what is currently occurring in their environment while a physical exercise requires a more internal investigation. Guided meditation is used as a physical exploration for breath awareness, leading the individual to observe the depth, quality, and control of breath. Self-touch, both physical and sensory, is used to bring attention to the

posture, position, and presentation of the body by providing real-time tactile feedback. These exercises serve to ground in the present and to encourage increased mindfulness for inner body awareness, or interoception. Interoception, or processing of the internal state of the body, is a valuable tool in substance abuse as loss of control and disconnection from the body leads to distrust of bodily cues (Hindi, 2012; Price & Hooven, 2018). Body-felt experiencing is an essential way to discover internalized sensations and feelings. Coming back to the physical and learning to listen to it helps individuals to distill what they are experiencing and feeling in the present moment.

Structure is a key ingredient which transforms the therapeutic space into a safe environment. When clients feel safe, they can explore trust, support, and build or test their own strengths and confidence through movement (Wagner, 1982; Kirane, 2018). One way to build structure is use of music as the rhythmic impetus for the beginning and end of the group. Another is to create specific movements as a ritual to mark the start or end of the group. Both of these ideas create an anchor for the member which allows them to orient themselves in relation to the timeline of the group. Music can be used for structure during a specific investigation. In the case of opioid use disorder, music which is identified as eliciting feelings of euphoria gives the client an opportunity to explore feelings in a controlled manner (Thomson, 1997). Music holds the structure while movement explores a state which is sought after and familiar but is ultimately maladaptive. The capacity to experience euphoria, which was previously tied to maladaptive behaviors, gives the client a tool to change the narrative of those feelings and to develop adaptive coping skills through experiencing. Music can also be used for structure through the course of the group. A steady rhythm provides support for moving together, and, as noted above, rhythmic entrainment encourages connection, community, and nonverbal communication. Another way

that structure can be used in a group is to quite literally gather in a structure, such as standing in a circle. In the circle, all members are able to see and be seen simultaneously. They are supported on each side and no member is singled out, which allows all members to come to the circle as equals. Once structure and safety are established, there is space for supported risk taking and exploration (Milliken, 2008; Thomson, 1997). Altering the structure of a group over time, beginning with well-structured sessions moving toward client-directed sessions, creates an opportunity for clients to take the risk of being a leader (Wagner, 1982). Practicing leadership in a supported environment empowers the client through authorship of choices, experiencing responsibility of leading others, and inspiring confidence that clients can craft their own structure, which they can then carry into their lives.

Knowledge of the self and learning new methods of coping are critically important to addiction treatment strategies (Lewis, 2015; Wagner, 1982). Explorations which examine behavior patterns, such as risky exploits or rituals of use, build self-awareness and broaden understanding of behaviors (Kirane, 2018). Understanding also assists clients in discerning reality and provides encouragement to take responsibility for the self, which is a vital step to ultimately changing behavior. These concepts are particularly relevant because they focus on learning. Learning about the self serves to educate clients on the motivating factors behind addiction. Development of a self-narrative through movement is an intervention that can be used to explore addiction as a transitional object. By bringing together movement and verbalization, a pathway is created which gives context to the subjective experience of the individual (Wagner, 1982). The examination and integration of a precipitating episode, such as relationship disruption or trauma, allows the individual to contextualize an event within their life timeline. Giving context can assist clients in moving from a disorganized and unproductive place to a

knowledgeable place where they can make proactive decisions (Breslin et al., 2003). An intervention addressing addiction from the perspective of affect intolerance includes expansion of emotional expression through movement. Substance abuse often develops as a way to avoid overwhelming feelings of the present which leads to disengagement. In this intervention, kinesthetic expansion, muscle tension, and movement quality are used to explore emotional expression on the body level. Physical exploration allows participants to face emotions which may be uncomfortable or unfamiliar and to observe how or if those emotions change through movement (Thomson, 1997). Embodied emotional experiencing without assistance of exogenous opioids also encourages participants to build tolerance for uncomfortable feelings and to gain a sense of mastery over those feelings on the body level (Milliken, 1990). Expansion of bodily skill and engagement of emotions through movement makes feeling states more consciously available to the mind. Once feelings are identified, participants can work to develop ways of responding, which fosters identifying what their needs are in the moment (Thomson, 1997). This process allows clients to practice agency in emotional regulation on a body level without the aid of substances. It also seeks to change understanding of motivations by crystalizing needs, which leads to increased clarity as to how to meet needs without chemical modulation.

Opioid use disorder is a stigmatizing and isolating experience in which individuals are disconnected from their bodies and from relationships. As a transitional object, addiction is often the substitute for healthy relationships both within the self and with others (Milliken, 2008). This makes relationship development an indispensable aspect of the treatment process. Practicing relationships serves to increase capacity for development of connections which are a necessary piece of moving forward in treatment. An important aspect of relationships is trust.

Dance/movement therapists develop trust through the use of kinesthetic empathy and mirroring

(Milliken, 2008). In this instance, nonverbal communication is their way to let the individual know that they are seen and that they are accepted. Nonverbal communication facilitates a safe haven for exploration and expression when clients are unable, or hesitant, to be themselves by building a bridge from verbal to non-verbal (Breslin et al., 2003). Nonverbal communication extends an invitation to enter into the relationship. Now relationships can be developed in many ways, through the use of rhythm, parallel play, in dyads, or in groups. Participation in a group offers individuals the latitude to develop different relationships: to music, to individuals, to self, and to the group as a whole (Thomson, 1997). This engenders the chance to expand trust beyond a singular therapeutic relationship (Milliken, 2008).

Groups generate a space in which clients can discover new ways of relating to others while concurrently developing awareness of sensations on the body level (Wagner, 1982). The group allows for skill practice of being in relationship with others while experiencing emotions. This process is an invaluable tool which offers a multisensory situation to address psychosocial, emotional, and physical aspects of interaction. Groups furnish opportunities for community, structure, and interpersonal interaction and allow participants the space to find what works for them through experiencing. Mirroring, as a group intervention, allows members to see themselves reflected by the group (Milliken, 2008). This enables members to witness themselves more clearly and to also observe how they are perceived by others. Mirroring further gives members the chance to recognize familiar aspects of emotion or movements in others, which signals to them that their experience is not singular. Having a chance to experience shared feelings fosters emotional growth, connection, sense of belonging and encourages positive physical feelings (Milliken, 1990). These interventions can be used to increase emotional and bodily awareness, which have been altered by opioid abuse, and to create a sense of connectivity.

Exploring group connectivity further, non-verbal interventions which use shared leadership in group movement serve to encourage feelings of support and relatedness, it allows participants to make directive choices through movement, and it offers a way to practice attunement (Thomson, 1997). Participants are empowered yet supported by the group and are challenged to listen on the body level. The group also offers members a place to explore alternative behaviors through direct physical experience (Milliken, 1990). For example, an intervention which looks at behavior begins with development of a movement phrase representational of opioid abuse or destructive patterns. That phrase is explored or expanded while paying attention to the bodily sensations and emotions which accompany the movement. Once this has been established, members move to explore patterns which ignite opposite emotion. The role of the group is to provide a supported environment where members can explore feelings of comfort or discomfort (Milliken, 2008; Thomson, 1997).

Structured play as an intervention can be used to define and strengthen boundaries, practice empathy, explore interactions in a nonthreatening environment, examine tension and aggression regulation, and to develop impulse control (Thomson, 1997). In structured play, the group acts as a laboratory for participants where members are free to practice adaptive behaviors and methods of coping (Milliken, 2008). It becomes a rehearsal space for everyday life. The here and now aspects of dance/movement therapy combined with structured play provides a platform for real-time development of adaptive coping skills (Thomson, 1997). A client who has internalized messages that they were weak for continuing to abuse opioids would benefit from an intervention constructed around the concepts of strength and success, such as pushing or using shared weight to accomplish a goal. In this instance they would need to exert themselves. The experience of embodied response and success helps the client to see themselves

as strong and capable. This exploration can lead to the illumination of unused qualities of movement and the possibility of reframing the self-view through re-experiencing. This might expand their possibilities for emotional expression and make space for discovery of another dimension of the self (Thomson, 1997). Practicing in structured play allows participants to play with self-expression and to experience relationships through verbal and non-verbal movement-oriented experiences (Milliken, 1990). Use of movement stimulates the imagination, allowing participants to visualize different ways of moving, and opens the door new possibilities.

Discussion

Dance/movement therapists are whole-person practitioners who harness the power of the body-mind pathway by crafting intentional, multisensory movement interventions. Their use of attunement and kinesthetic empathy aids in the interpretation of movement, nonverbal expression, behavior, and emotion. Through psychotherapeutic intervention, attention to body awareness, and development of interpersonal and intrapersonal communication, dance/movement therapists create a space which honors subjective experience. They also build relationships. Through transactional relationship, therapists are able to craft movement interventions which enhance the value of what dance and movement bring to the therapeutic space while adapting to individual needs. This ability of shaping to encompass whatever is present in the moment speaks to the flexible nature of dance/movement therapy and its ability to be conducted in a variety of settings, with a wide range of populations and cultures.

As opioids exert their effects multidimensionally, it makes sense that a multidimensional approach is needed for comprehensive treatment. Dance/movement therapy is well positioned because it addresses the multilevel human experience in an approach to wellness. Examination

and integration of psychological and psychosocial factors influencing addiction, complements flexibility in meeting the needs of clients, and makes better investigators who are more open to what is driving addiction. Having a general knowledge of different perspectives on addiction, enhances awareness of biases, and complements the nonjudgmental nature of dance/movement therapy. Additionally, a dance/movement therapist working with opioid abuse will benefit from familiarity with the stages of change. There are six stages: precontemplation, contemplation, determination, action, maintenance, and relapse (Connors et al., 2013). Each stage involves its own unique set of tasks, attitudes, and behaviors (in precontemplation, there is no awareness of a problem, with more perceived positives than negatives about opioid use, while in contemplation, there is consideration that change is needed and what the consequences of change would be). Dance/movement therapists are uniquely qualified to identify these stages through the body by attuning to the client. Embodied movement through these stages reinforces the emotional and psychological change on the body level.

Dance stimulates several brain functions all at once through multisensory engagement (Teixeira-Machado, 2019). Kinesthetic interventions exploring spatial orientation, movement coordination, balance, and endurance serve to increase the brain's perception of one's physical body and to orient one in space. Interventions which combine physical activity with sensory enrichment through rhythm, increase nonverbal communication, and engage both body and brain through interpretation of sound. These explorations allow for rhythmicity, coordination and regulation of movement in time with others, which increases community and strengthening of social bonds (Quiroga Murcia, 2010). Rhythmic entrainment centered on natural rhythms, such as heartbeat or breath, increases body apperception, develops interpersonal communication, and allows for identification of the self in others. Physical movement also serves as a creative outlet

for pent up anger, tension, or resistance (Milliken, 1990). Interventions exploring range of emotional expression through kinesthetic expansion, muscle tension, and postural shifts, encourages self-efficacy, and mastery of emotions, through the experience of being in charge of the body and its actions.

Opioid use disorder requires being open to treating the whole person and not just the piece that is addiction. Manifestation of opioid abuse is an overlapping, multisystem, onslaught which makes segmented treatment an ineffective approach. Knowledge of interrelated processes increases capacity to address, and enhances sensitivity for, the involuntary feelings of withdrawal (dysphoria, pain, and malaise) as well as complicated psychological and emotional responses (depression, agitation, loss of self-efficacy). Dance/movement therapists know that there is a reciprocal action between the body and the brain and that separation of the whole into pieces is antithetical to whole person healing. Knowledge of the functioning and interrelated presentations of opioid abuse is especially important in co-occurring cases as it may be difficult to discern whether symptoms are a result of opioid abuse or if they are a manifestation of something else. In the instance of co-occurring diagnosis, dance/movement therapists can use their knowledge of the body to observe, attune, and give a voice to indicators of opioid abuse. By focusing on embodied healing in any given moment, dance/movement therapy creates an inclusive method of addressing all aspects of the person. Dance/movement therapists with knowledge of potential variability of manifestations are empowered to provide clarity in treatment approaches, documentation, and in advocacy.

A skilled dance/movement therapist is positioned to meet the client wherever they might be on their every-changing journey. With awareness of the stages of change in substance abuse and treatment, and knowledgeable of the trajectory of opioid abuse, dance/movement therapists

are poised to advocate for necessary treatment for their clients. When medically assisted treatment is available, dance/movement therapists can provide support when clients choose to participate. If clients are hesitating, questioning efficacy of treatment, are concerned about stigma, or do not have medically assisted treatment available, dance/movement therapists can use their knowledge of the body-mind pathway and the biological progression of opioid use disorder to provide insight to the client, to address barriers to treatment, and to strengthen the therapeutic relationship. In this way, dance/movement therapists build a bridge by connecting both body to mind and client to treatment. Dance/movement therapists also bridge the gap between the client and the treatment team. Knowledge of the functionality of opioid use disorder positions the dance/movement therapist as an advocate who represents the client to the treatment team in a holistic fashion. In this way advocacy is double sided. The capacity to address biological considerations in an embodied way helps to clarify rationale for treatment, enhances therapeutic goal setting, increases ability to communicate concerns with the other clinicians, and in doing so, creates space for advocacy. As specialists, representing the body-mind relationship in clinical practice, dance/movement therapists model integration of the field of dance/movement therapy to other disciplines and care providers.

Conclusion

Opioid use disorder is a chronic condition. There is no cure, nor is there true recovery to the previous state. While long term abstinence is the goal, every day requires engagement in a change of lifestyle, one in which relapse is a very real possibility. Availability of treatment and stigmatization of abuse create challenges which make both acute and long term treatment a rocky road for many. Dance/movement therapy gives simultaneous attention to emotional, physical,

and social wellbeing. It also has documented neurological implications including encouraging neuroplasticity through motoric learning. These multilevel engagements make dance/movement therapy an effective modality for opioid use disorder treatment. For these reasons, when possible, dance/movement therapy needs to take advantage of every opportunity to partner with medically assisted treatment in order to craft a truly multi-sensory whole-person approach. While partnering with medically assisted treatment would be ideal, realistically, due to incorrect assumptions, slow adoption, and stigma, dance/movement therapists will find themselves working as part of a system or with clients who do not have access to, or a desire to use medically assisted treatment. In any case, dance/movement therapy, offers embodied action, exploration, and understanding to participants so that they might engage in a learning process for life long wellness.

References

- Acolin, J. (2016). The mind–body connection in dance/movement therapy: Theory and empirical support. *American Journal of Dance Therapy*, 38(2), 311-333.
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: Author.
- Beltran-Campos, V., Silva-Vera, M., Garcia-Campos, M. L., & Diaz-Cintra, S. (2015). Effects of morphine on brain plasticity. *Neurología (English Edition)*, 30(3), 176-180.
- Berrol, C. F. (1992). The neurophysiologic basis of the mind-body connection in dance/movement therapy. *American Journal of Dance Therapy*, 14(1), 19-29.
- Berrol, C. F. (2006). Neuroscience meets dance/movement therapy: Mirror neurons, the therapeutic process and empathy. *The Arts in Psychotherapy*, 33(4), 302-315.
- Booth, M. (2013). *Opium: a history*. St. Martin's Griffin.
- Boudreau, S. A., Farina, D., & Falla, D. (2010). The role of motor learning and neuroplasticity in designing rehabilitation approaches for musculoskeletal pain disorders. *Manual therapy*, 15(5), 410-414.
- Breslin, K. T., Reed, M. R., & Malone, S. B. (2003). An holistic approach to substance abuse treatment. *Journal of Psychoactive Drugs*, 35(2), 247-51. Retrieved from <https://search.proquest.com/docview/207973290?accountid=13701>
- Brick, J., & Erickson, C. K. (1998). *Drugs, the brain, and behavior: The pharmacology of abuse and dependence*. Haworth Medical Press.
- Chaiklin, S., & Wengrower, H. (Eds.). (2015). *The art and science of dance/movement therapy: Life is dance*. Routledge.
- Connors, G. J., DiClemente, C. C., Velasquez, M. M., & Donovan, D. M. (2013). *Substance abuse treatment and the stages of change: Selecting and planning interventions*. Guilford Press.
- Connery, H. S. (2015). Medication-assisted treatment of opioid use disorder: review of the evidence and future directions. *Harvard Review of Psychiatry*, 23(2), 63-75.
- Dayan, E., & Cohen, L. G. (2011). Neuroplasticity subserving motor skill learning. *Neuron*, 72(3), 443-454.
- Does Long-Term Opiate Use Change the Brain? (Guide). (2018, May 29). Retrieved from <https://medmark.com/does-long-term-opiate-use-change-the-brain/>

- Hackney, M. E., Kantorovich, S., Levin, R., & Earhart, G. M. (2007). Effects of tango on functional mobility in Parkinson's disease: a preliminary study. *Journal of neurologic physical therapy*, 31(4), 173-179.
- Hindi, F. S. (2012). How attention to interoception can inform dance/movement therapy. *American Journal of Dance Therapy*, 34(2), 129-140.
- Homann, K. B. (2010). Embodied concepts of neurobiology in dance/movement therapy practice. *American Journal of Dance Therapy*, 32(2), 80-99.
- Hui, E., Chui, B. T. K., & Woo, J. (2009). Effects of dance on physical and psychological well-being in older persons. *Archives of Gerontology and Geriatrics*, 49(1), e45-e50.
- Jeong, Y. J., Hong, S. C., Lee, M. S., Park, M. C., Kim, Y. K., & Suh, C. M. (2005). Dance movement therapy improves emotional responses and modulates neurohormones in adolescents with mild depression. *International Journal of Neuroscience*, 115(12), 1711-1720.
- Johnson, B. (1999). Three perspectives on addiction. *Journal of the American Psychoanalytic Association*, 47(3), 791-815.
- Karpati, F. J., Giacosa, C., Foster, N. E., Penhune, V. B., & Hyde, K. L. (2015). Dance and the brain: a review. *Annals of the New York Academy of Sciences*, 1337(1), 140-146
- Kiepe, M. S., Stöckigt, B., & Keil, T. (2012). Effects of dance therapy and ballroom dances on physical and mental illnesses: A systematic review. *The Arts in Psychotherapy*, 39(5), 404-411.
- Kirane, K. (2018). Dance/movement therapy: a unique response to the opioid crisis. *The American Journal of Dance Movement Therapy*, 40, 12-17
- Koob, G. F., Sanna, P. P., & Bloom, F. E. (1998). Neuroscience of addiction. *Neuron*, 21(3), 467-476.
- Kosten, T. R., & George, T. P. (2002). The neurobiology of opioid dependence: implications for treatment. *Science & Practice Perspectives*, 1(1), 13.
- Milliken, R. (1990). Dance/movement therapy with the substance abuser. *The Arts in Psychotherapy*.
- Milliken, R. (2008). Intervening in the cycle of addiction, violence, and shame: A dance/movement therapy group approach in a jail addictions program. *Journal of Groups in Addiction & Recovery*, 3(1-2), 5-22.
- Leppä, M., Korvenoja, A., Carlson, S., Timonen, P., Martinkauppi, S., Ahonen, J., Rosenberg, P., Aronen, H., & Kalso, E. (2006). Acute opioid effects on human brain as revealed by functional magnetic resonance imaging. *Neuroimage*, 31(2), 661-669.

- Leung, P. T., Macdonald, E. M., Stanbrook, M. B., Dhalla, I. A., & Juurlink, D. N. (2017). A 1980 letter on the risk of opioid addiction. *New England Journal of Medicine*, 376(22), 2194-2195.
- Lewis, M. (2015). *The biology of desire: Why addiction is not a disease*. Hachette UK.
- Mang, C. S., Campbell, K. L., Ross, C. J., & Boyd, L. A. (2013). Promoting neuroplasticity for motor rehabilitation after stroke: considering the effects of aerobic exercise and genetic variation on brain-derived neurotrophic factor. *Physical Therapy*, 93(12), 1707-1716.
- Mayo Clinic Staff (May 8, 2018) How to tell if a loved one is abusing opioids. Retrieved from <https://www.mayoclinic.org/diseases-conditions/prescription-drug-abuse/in-depth/how-to-tell-if-a-loved-one-is-abusing-opioids/art-20386038?p=1>
- Medications to Treat Opioid Use Disorder (n.d.) Retrieved from: <https://www.drugabuse.gov/publications/research-reports/medications-to-treat-opioid-addiction/overview>
- Morone, N. E., & Weiner, D. K. (2013). Pain as the fifth vital sign: exposing the vital need for pain education. *Clinical Therapeutics*, 35(11), 1728-1732.
- Müller, P., Rehfeld, K., Schmicker, M., Hökelmann, A., Dordevic, M., Lessmann, V., ... & Müller, N. G. (2017). Evolution of neuroplasticity in response to physical activity in old age: the case for dancing. *Frontiers in aging neuroscience*, 9, 56.
- National Institutes of Health (January 2019) Opioid Overdose Crisis. Retrieved from <https://www.drugabuse.gov/drugs-abuse/opioids/opioid-overdose-crisis>
- Olsen, Y., & Sharfstein, J. M. (2014). Confronting the stigma of opioid use disorder—and its treatment. *Jama*, 311(14), 1393-1394.
- Porter, J., & Jick, H. (1980). Addiction rare in patients treated with narcotics. *The New England journal of medicine*, 302(2), 123.
- Potenza, M. N., Sofuoglu, M., Carroll, K. M., & Rounsaville, B. J. (2011). Neuroscience of behavioral and pharmacological treatments for addictions. *Neuron*, 69(4), 695-712.
- Price, C. J., & Hooven, C. (2018). Interoceptive awareness skills for emotion regulation: Theory and approach of mindful awareness in body-oriented therapy (MABT). *Frontiers in Psychology*, 9, 798.
- Quiroga Murcia, C., Kreutz, G., Clift, S., & Bongard, S. (2010). Shall we dance? An exploration of the perceived benefits of dancing on well-being. *Arts & Health*, 2(2), 149-163.
- Rehfeld, K., Lüders, A., Hökelmann, A., Lessmann, V., Kaufmann, J., Brigadski, T., ... & Müller, N. G. (2018). Dance training is superior to repetitive physical exercise in inducing brain plasticity in the elderly. *PloS one*, 13(7).

- Ritter, M., & Low, K. G. (1996). Effects of dance/movement therapy: A meta-analysis. *The Arts in Psychotherapy*, 23(3), 249-260.
- Rossberg-Gempton, I., & Poole, G. D. (1992). The relationship between body movement and affect: From historical and current perspectives. *The Arts in Psychotherapy*.
- Rumans, T. A., Burton, M. C., & Dawson, N. L. (March 2018). How good intentions contributed to bad outcomes: the opioid crisis. In *Mayo Clinic Proceedings* (Vol. 93, No. 3, pp. 344-350). Elsevier.
- Savvas, S. M. (2013). The effect of opioids on emotional reactivity (Doctoral dissertation).
- Shiel Jr., William C. (2018, Decembe 11). Medical Definition of Chronic pain. Retrieved from <https://www.medicinenet.com/script/main/art.asp?articlekey=22430>
- Scholl, L., Seth, P., Kariisa, M., Wilson, N., Baldwin, G. (January 4, 2019). Drug and Opioid-Involved Overdose Deaths — United States, 2013–2017. Retrieved from https://www.cdc.gov/mmwr/volumes/67/wr/mm675152e1.htm?s_cid=mm675152e1_w
- Shim, M., Goodill, S., & Bradt, J. (2019). Mechanisms of dance/movement therapy for building resilience in people experiencing chronic pain. *American Journal of Dance Therapy*, 41(1), 87-112.
- Teixeira-Machado, L., Arida, R. M., & de Jesus Mari, J. (2019). Dance for neuroplasticity: A descriptive systematic review. *Neuroscience & Biobehavioral Reviews*, 96, 232-240.
- Tinkler, E., Vallejos Bartlett, C., Brooks, M., Gilbert, J. M., Henderson, R., & Shuman, D. (2005). Medication-Assisted Treatment For Opioid Addiction in Opioid Treatment Programs. Treatment Improvement Protocol (TIP) Series 43. Substance Abuse and Mental Health Services Administration.
- Thomson, D. M. (1997). Dance/movement therapy with the dual-diagnosed: A vehicle to the self in the service of recovery. *American Journal of Dance Therapy*, 19(1), 63-79.
- Wagner, L. (1982) The use of movement therapy in substance abuse rehabilitation (Thesis, Dissertation) University of California, Los Angeles, California
- United States. General Accounting Office. (2003). Prescription Drugs: OxyContin Abuse and Diversion and Efforts to Address the Problem: Report to Congressional Requesters. DIANE Publishing.
- U.S. Opioid Prescribing Rate Maps (October 3, 2018). Retrieved from <https://www.cdc.gov/drugoverdose/maps/rxrate-maps.html>
- Yerby, N., (August 28, 2019). Statistics on Addiction in America. Retrieved from <https://www.addictioncenter.com/addiction/addiction-statistics/>