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Assessing the Impact of Yoga as a Moderator on Substance Abuse Treatment Effectiveness

Joseph Antonio McDaniel
Walden University

Walden University

College of Social and Behavioral Sciences

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Joseph McDaniel

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Review Committee
Dr. David Mohr, Committee Chairperson, Psychology Faculty
Dr. Randall Oberhoff, Committee Member, Psychology Faculty
Dr. John Schmidt, University Reviewer, Psychology Faculty

Chief Academic Officer
Eric Riedel, Ph.D.

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Abstract

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Joseph Antonio McDaniel III

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Dissertation Submitted in Partial Fulfillment

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Abstract

Self-efficacy and treatment adherence reduce substance dependence. Yoga has been suggested as an adjunct to substance dependence treatment to enhance outcomes. This study was designed to assess yoga as a moderator of substance abuse treatment effectiveness, as indicated by the Exercise Self-Efficacy survey and Treatment Effectiveness Assessment scores. This study was guided by self-efficacy theory and used a nonequivalent quasi-experimental design to evaluate self-efficacy changes and treatment effectiveness. A drug treatment program that did not incorporate yoga as an adjunct to treatment was compared to another treatment program that did. Convenience sampling strategy was utilized to recruit 100 voluntary yoga and nonyoga participants from each substance abuse treatment facility in urban south central and southwestern United States. Independent one-way *t* tests, linear regression, and a nonparametric test were performed to determine yoga adherence effect on substance abuse treatment effectiveness. The results demonstrated no significant difference with respect to treatment effectiveness for either the yoga or nonyoga treatment groups. This study contributes to positive social change by showing that yoga exercise is not, contrary to earlier suggestions, effective at reducing substance addiction severity. While this study furthers the advance and understanding of the impact of yoga exercise, it demonstrated no increase in treatment effectiveness, suggesting that other areas of research should be pursued to identify adjuncts to improve substance abuse treatment.

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Dedication

The content of this research is dedicated to my lovely wife, Karen McDaniel, and my daughter, Janea' McDaniel. Without both of you, this task would not have been possible. In addition, I would like to give thanks my late parents, Joseph McDaniel Jr. and Emma McDaniel, for their guidance.

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Chapter 1: Introduction to the Study

Substance abuse continues to plague society, as indicated by related, health, social, and economic issues (Brook, Brook, Rubenstone, Zhang, & Saar, 2011). It exacts a significant toll on society, as demonstrated by family and social discord that lead to early life stressors and a lifestyle of addiction vulnerability (Kippin, Campbell, Ploense, Knight, & Bagley, 2015). Drug dependent individuals create distorted social environments and develop inappropriate coping strategies, resulting in a myriad of dysfunctional drug seeking behaviors (Lipton et al., 2013). Timko, et al. (2012) determined there is a direct link between substance use disorders (SUDs) and engagement in multiple health risk behaviors. However, Feingold, Weiser, Rhem, and Lev-Ran (2014) argued that while there is a link between chronic drug usage and mood disorders, the relationship is unclear.

The rise of SUDs has affected and continues to have a major impact on U.S. society in many ways. SUDs have significant social and behavioral ramifications that translate into economic loss and premature mortality (Sunderland, Slade, & Krueger, 2015). For example, many substance abusers fail to secure or and maintain employment due to recurrent relapse episodes (Mathews, Jewkes, & Abrahams, 2015). High-intensity substance usage is associated with difficulty in seeking employment unless the individual has a secured social support system, high levels of self-motivation, or a healthy sense of self-efficacy (Ti et al., 2014). Brook, Pahl, Brook, and Morojele (2014) argued that there are a multitude of risk factors which can be addressed early in life by implementing protective factors to mitigate adolescents' substance use and subsequent abuse.

The typical measures used to treat substance addiction have consisted of cognitive behavioral interventions and relapse prevention approaches that have since proven to be ineffective (Woody, 2014). Self-efficacy, an individual's belief about self-regulation of behaviors, is important in completion of any task and plays significant importance in substance dependence prevention (Connor, Gullo, Feeney, Kavanagh, & Young, 2014). Schwabe, Dickinson, and Wolf (2011) argued that ineffective coping skills negatively influence cognitive functioning and subsequent drug dependent behaviors. Delgadillo et al. (2014) asserted that individuals who undergo training in self-efficacious behaviors demonstrate a higher degree of self-efficacy in comparison to control group subjects.

Background of the Problem

The concept of substance dependency has attracted the attention of health professionals since the early 1900s (Musto, 1987). Drug dependence became a major issue in the United States in the 1930s, when the use of barbiturates and marijuana became popular (Provine, 2011). Investigators have attempted to understand why some individuals become drug dependent while others did not (Franklin, Mumma, Jagannathan, Wetherill, & Childress, 2015). Hundreds of factors ranging from psychological traits to family factors have been identified as contributing to substance use (Franklin et al., 2015). Consequently, mental health and substance abuse professionals have been frustrated in their fight to adequately address and treat substance dependence (Morse, Silverstein, Thomas, Bedel, & Cerulli, 2015).

The primary purpose of therapeutic community (TC) is to establish a holistic means to treatment recognizing individual stages of change. The Substance Abuse and Mental Health Services Administration (SAMSA) introduced TCs in the United States in

1958 as an alternative to drug treatment because psychotherapy and general medicine had proven to be ineffective (De Leon, Perfas, Joseph, & Bunt, 2015). TCs are designed to reduce residents' propensity for substance dependence, and address problems with a wide variety of substances in a residential treatment setting. Magor-Blatch, Keen, and Bhullar (2014) demonstrated that stable, long-term treatment in TCs often results in substantial overall improvement, but is dependent on client and treatment characteristics. Heavy substance dependence and polysubstance use in conjunction with extensive resistive behaviors elicit poor treatment outcomes (De Leon et al., 2015). In comparison, Best et al. (2014) demonstrated that controlling substance dependence is contingent on program completion, which indicates an individual's successful adherence to TC guidelines with respect to graduating from a specific drug treatment program.

Roughly 25–50% of individuals seen in U.S. emergency rooms present with serious substance dependence issues, making rapid identification of dependency levels and treatment referrals of great importance (McDonnell, Brookes, & Lurigio, 2014). However, some community treatment programs have major flaws consisting of unclear screening procedures (Blasko & Hiller, 2014). Additional irregularities noted in similar studies include one-size-fits-all treatment approaches, limited clinical program supervision, and insufficient discharge planning (Woody, 2014). The use of one-size-fits-all treatment is problematic because individually tailored treatment enhances treatment effectiveness and overall completion rates (Knable, Cantrell, Vander Meer, & Levine, 2015). Gustin, Nichols, and Martin (2015) stated that only a combination of personalized treatment paradigms that include psychosocial approaches to treatment and behavioral

management in conjunction with effective psychopharmacological intervention have proven to be effective.

Ali, Seitz-Brown, and Daughters (2014) linked SUDs to mental health issues and stated that they must be addressed by implementing distress tolerance skill training. Effective substance abuse treatment programs must incorporate stress reduction training as an adjunct methodology in addressing the primary factor that fosters drug-seeking behaviors (McGillicuddy, Rychtarik, & Papandonatos, 2015). Van Amsterdam, Brunt, and van den Brink (2014) stated that the use of cannabinoids is associated with an increased occurrence of psychosis in individuals who have a predisposition to mental illness. Individuals with poor coping skills who are genetically susceptible to undiagnosed mental illness and engage in gateway drugs such as marijuana and synthetic cannabinoids have an enhanced initial onset of psychosis and other psychiatric disorders (Kippin, Campbell, Ploense, Knight, & Bagley, 2015).

Stevens, Verdejo-García, Roeyers, Goudriaan, and Vanderplasschen (2014) recommended that drug addiction be addressed as a chronic disease with treatment consisting of a therapeutic step-down approach, after initial treatment in community treatment programs. Substance dependent individuals often experience complications related to health issues in addition to repeated cycles of continued usage after initial treatment, making a step-down approach imperative (Myers & Wodarski, 2015). In addition to health problems, substance-dependent individuals present with cyclical patterns of what McKay and Hiller-Sturmhöfel (2011) referred to as substance dependency followed by treatment careers. Yang (2014) argued that aftercare programs

must include comprehensive assessments once initial treatment is completed as well as wraparound services to demonstrate effectiveness.

With respect to altering traditional treatment methods, many researchers have considered the implementation of Motivational Interviewing (MI) Relaxation Training (RT) psycho-dynamically oriented psychotherapy, or group drug counseling (Riper et al., 2014). For decades, therapists have acknowledged the effectiveness of spirituality in conjunction with treating substance-dependent individuals (Pardini, Plante, Sherman & Stump 2000). Spirituality-based treatment includes 12-step programs such as Alcoholics Anonymous (AA) and Narcotics Anonymous (NA) (Kelly, Greene, & Bergman, 2014). This study was designed to bridge a gap in the literature regarding involvement in yoga, enhanced self-efficacy, and treatment effectiveness for substance-dependent individuals.

Problem Statement

According to the National Institute on Drug Abuse (NIDA), SUDs have become one of society's most challenging public health issues (Rawson, Woody, Kresina, & Gust, 2015). Alcohol and drug dependence significantly and negatively affect a patient's level of functioning as well as their overall quality of life (Mitchell et al., 2015). Individuals with SUDs present with co-occurring impulsive angry behavior and legal issues in conjunction with other behavioral risk factors (Swanson et al., 2015). Pietrzak et al. (2015) detailed how SUDs are risk factors for mental illness, income related issues and homelessness. Tomko, Trull, Wood, and Sher (2014) presented arguments supporting the correlation between SUDs, severe mental illness and medical comorbidity.

Millions of people who enter emergency rooms meet criteria for SUDs, but never receive treatment (Ober, Watkins, Hunter, Lamp Lind, & Setodji (2015). Therefore, a

large percentage of individuals who seek emergency medical services with co-occurring substance abuse issues do not receive treatment. To address the overwhelming drug issue, primary care settings must screen and refer individuals with SUDs to appropriate treatment programs. Gotham, Knopf-Amelung, Krom, Stilen, and Kohnle (2015) detailed how many educational curriculums in health care training programs have failed to address SUDs. The advent of Screening, Brief Intervention and Referral to Treatment (SBIRT) programs implemented by Substance Abuse and Mental Health Services Administration (SAMHSA) in the late 1990s began to address addiction, which had been previously overlooked in emergency settings (Katz, 2015). The evolution of SBIRT from developmental stages in the 1990s to the present has increased awareness of substance dependence as a screening methodology in emergency room settings (Muench et al., 2015).

The problem is that existing programs fail to implement adjunct exercise intervention in the reduction of SUDs. Segat et al. (2014) argued that the effectiveness of exercise and physical activity proves to show a reduction of relapse episodes. According to Stoutenberg, Warne, Vidot, Jimenez, and Read (2015) drug dependent individuals who participated in weekly yoga demonstrated a significant reduction in severity of dependence, increased self-esteem and improved overall health. As argued by Brown et al. (2014) the use of yoga in treating alcohol addiction is an effective adjunct treatment, but has limited research demonstrating its effectiveness.

Nandar and Urs (2014) stated that the practice of yoga has gained much attention from various health care professionals for its beneficial therapeutic effects. In addition to activating respiratory and digestive systems, yoga has beneficial effects on muscle tone

development while enhancing flexibility, strength and endurance (Nandar & Urs, 2014). Chen et al. (2015) detailed how mind-body exercises such as yoga demonstrate efficacy in the treatment of individuals with SUDs. Everitt (2014) describes how compulsive drug addiction is a goal directed, learned behavior, where individuals are unable to effectively address anxiety and other life stressors. According to Sharma (2014), yoga has a demonstrated effectiveness as an efficient method of reducing stress levels providing alternative methods of handling life stressors. Individuals with SUDs begin to show improvement when engaged in adjunct therapy incorporating yoga (Prousky, 2012). Dealing with life stressors is of primary concern for individuals with SUDs and treatment modalities consisting of yoga could prove to be beneficial in the development of coping skills.

Purpose of the Study

The purpose of this classic quasi-experimental design known as nonequivalent group design is to demonstrate how yoga enhances treatment effectiveness and reduces the severity of substance dependence by gathering data from lifestyle behaviors and psychosocial correlates. This study was designed to generate useful evidence for use by substance treatment facilities and mental health professionals in assisting individuals enhance the quality of their lives.

Research Questions and Hypotheses

This study determines the relationship between yoga participation and treatment effectiveness. The research questions and relative hypothesis associated with each are as follows:

1. Do patients who engage in adjunct yoga exercise have increased substance abuse treatment effectiveness?
    - Hypothesis 1_0: Patients who engage in adjunct yoga exercise do not have increased substance abuse treatment effectiveness.
    - Hypothesis 1_a: Patients who engage in adjunct yoga exercise have increased substance abuse treatment effectiveness.
2. Do patients who engage in adjunct yoga exercise have increased self-efficacy?
    - Hypothesis 2_0: Patients who engage in adjunct yoga exercise do not have increased self-efficacy.
    - Hypothesis 2a: Patients who engage in adjunct yoga exercise have increased self-efficacy.
3. Does adjunct yoga exercise moderate the relationship between patient self-efficacy and substance abuse treatment effectiveness?
    - Hypothesis 3_0: Patients who engage in adjunct yoga exercise do not have higher levels of self-efficacy and do not demonstrate a strengthening of the relationship between yoga and treatment effectiveness.
    - Hypothesis 3a: Patients who engage in adjunct yoga exercise have higher levels of self-efficacy and demonstrate a strengthening of the relationship between yoga and treatment effectiveness.

Theoretical Framework

The foundation for this study is Bandura's self-efficacy theory, which describes how individuals perceive their ability to succeed in changing specifics about their lives (Hsu, Wiklund & Cotton, 2015). Bandura argued that the core belief of the self-efficacy

theory is the fundamental theory for success in human motivation, the performance of specific tasks, and the emotional well-being of humans. Further, Bandura asserted self-efficacy is closely associated with the perceived ability to successfully, change behaviors (Lockwood & Wohl, 2012). Furthermore, Lockwood and Wohl (2012) found that self-efficacy was global oriented, situational specific, and interacts with behaviors that influenced the future responses of people.

Warner, Schuz, Knittle, Ziegelmann, and Wurm (2011) stated that a person's ability to develop the confidence needed to complete an exercise program and the capacity to perform the required activities is determined through mental preparedness. Sweet, Fortier, Stracher, and Blanchsrd (2012) identified the strong predictive characteristic of self-efficacy with respect to physical activities. In their study, Cramp and Bray (2011) utilized self-efficacy theory to demonstrate how the psychological construct related to behavioral changes, when an exercise program had a strong correlation with program adherence. Self-efficacy theory is suitable for this study as the theory measures individual confidence levels with respect to engaging in voluntary, self-initiated adjunct substance abuse treatment.

Nature of the Study

The study used a nonequivalent group quasi-experimental design to determine if adjunct yoga exercise increased patient self-efficacy and treatment effectiveness, as well as if adjunct yoga exercise moderated the relationship between patient self-efficacy and treatment effectiveness. Survey instruments were used to answer questions related to treatment effectiveness and the level of confidence concerning exercise adherence. The data collected contributed to the investigation of whether participation in a yoga program

affected exercise confidence and treatment effectiveness. The dependent variables of this study were patient self-efficacy as measured by Exercise Self-Efficacy (ESE) survey and treatment effectiveness as measured by as the Treatment Effectiveness Assessment (TEA) survey, and adjunct yoga exercise was both an independent and moderating variable. Specifically, the ESE assessed the level of confidence concerning exercise adherence and the TEA assessed treatment effectiveness. The TEA assessed treatment effectiveness and provided clinically pertinent responses to treatment used to help clinicians and the patients gauge treatment progress and recovery.

The survey population consisted of individuals with substance dependence issues from large cities in the south-central part and southwestern parts of the United States. According to Epstein et al. (2014) the entire south-central and southwestern portions of the United States' are prime locations for drug dependence. A linear regression analysis was done to determine the linear, adaptive relationship between variables of exercise self-efficacy, treatment effectiveness and demographics.

Definitions of Terms

Criminogenic Needs: Internal and external factors that lead to an need for physical aggression, violent fantasies, and a blatant disregard for the law encouraging an individual to engage in criminal behavior (Ward & Stewart 2003).

Exercise Self-Efficacy: An indicator by which to determine individual adoption and maintenance of exercise behaviors (Cramp & Bray, 2011).

In-Prison Therapeutic Communities (IPTCs)*:* Institutionally sanctioned substance abuse felony punishment facility (Wexler, Falkin, & Lipton, 1990).

Psychiatric Instability: The propensity to exhibit mental insufficiencies as demonstrated by a wide range of mental disorders (Spindler, Stopsack, Aldinger, Grabe & Barnow 2016).

Self-Efficacy: Individual judgments of one's personal capabilities that can enhance or hinder motivation (Armitage, Wright, Parfitt, Pegington, Donnelly, & Harvie, 2014).

Socioeconomic Status: The degree of educational, social and economic differences of a population (Merkin, Karlamangla, Diez Roux, Shrager, & Seeman, 2014).

Substance Abuse: The overindulgence or abuse of a drug or other substance leading to devastating mental and physical effects (Butler, Kane, & McAlpin, 2014).

Substance Abuse Disorders: The use of alcohol or other mood-altering substances, which result in an undesired effect on the lives of the user (Gurewich, Prottas, & Sirkin, 2014).

Substance Dependence: When use of a specific substance continues despite the occurrence of substance-related problematic issues (Saitz, Cheng, Allensworth-Davies, Winter, & Smith, 2014).

Substance Use Disorders (SUDs): Conditions found in individuals similar to felons that are generally psychological in nature and are considered to be secondary to drug usage (Prins, Elliott, Meyers, Verheul, & Hasin, 2014).

Yoga or Yogic Exercise: A form of physical and mental exercise from India that has been practiced for more than 5,000 years to enhance body and mind unity (Sharma, 2014).

Assumptions, Delimitations and Limitations

Assumptions

One assumption of this survey research was that the survey participants would answer the questions on the ESE and TEA with honesty and accuracy. Another assumption was that participants would have the intellectual ability to comprehend the questions listed on the assessment tools. It was also assumed that participants would believe SUDs have had a negative effect on their lives and that they exhibit a desire to change. The assumptions were necessary as I sought to assess the outcome of the study with reliability and validity. In order to mitigate these assumptions, I utilized a sufficiently large sample size along with standard statistical procedures when analyzing relationships among the variables.

Delimitations

The scope of this research was limited to individuals with diagnosed substance abuse issues. However, drug abusers in society who have not been diagnosed could benefit from the results of this survey. Another delimiter of the sample pool was that only substance users in treatment programs that either offer, or do not offer yoga as an adjunct method of treatment would participate in the study. Inclusion criteria for this study required that study participants be currently enrolled in a treatment program and undergoing treatment for SUDs. The interest in this topic was derived from a review of the current literature indicating a need for adjunct treatment of substance-dependent individuals. The results of this survey study could be beneficial as an alternative to traditional SUD programs.

Limitations

Participants of the study included individuals over the age of 18 who were enrolled in substance use program. Limiting study participants by choosing from specific geographical locations was also a limitation. The nature of self-reporting was a limitation as respondents may not have been forthright with respect to providing accurate information. The population sample was also considered a limitation as individuals with substance abuse histories tend to be very guarded.

Significance of the Study

The current study laid the groundwork for future research in clinical psychology as the results of the study could reduce the likelihood of substance abuse episodes in individuals with the proclivity to exhibit drug-seeking behaviors. Community treatment programs could use the results of this research in their attempt to reduce substance dependency rates. The results of the study could bring about positive social change by reducing the factors associated with SUDs for drug dependent individuals and could eliminate the mental and social impairments associated with self-defeatist attitudes (Briones, Tabernero & Arenas, 2007). The goal of this study was to bring about positive social change by focusing primarily on the commitment that a yoga treatment programs could increase self-efficacy and reduce substance dependency in individuals with substance abuse dependency. Social change implications realized through the introduction of yoga as an adjunct to substance abuse treatment programs could enhance individual self-esteem. In addition, such programs could aid in helping drug dependent individuals become productive members of society. Further, the results of this survey could benefit social change by enhancing awareness on how to reduce substance

dependency in society. Clinical psychologists could benefit from this study by utilizing alternative methods offered in this survey to treat SUDs. Positive social change occurs when drug usage decreases, individuals secure employment, a reduction in negative social and health consequences are apparent, and drug dependent individuals become productive members of society (Degenhardt, Whiteford, & Hall, 2014). Reduced drug usage enhances opportunities to rebuild family bonds while reducing the occurrence of, social and health issues due to drug use.

Summary and Transition

Chapter 1 provided a discussion about SUDs and a variety of factors that contributed to social and health related issues. The chapter discussed the background of the problem and the concepts of drug abuse in the United States. The chapter also provided a brief history of drug usage and the effects of drug abuse on society. In the problem statement, the chapter defined the issues that contributed to the study and outlined the specific problem for the study. The use of yoga as an identified adjunct therapeutic approach in reducing SUDs in individuals with co-occurring medical and mental health issues was also presented. The purpose statement detailed the methodology and design of the study. The introduction of alternative treatment methods such as yoga, to traditional forms of clinical therapy for SUDs was proposed to decrease the rate of substance usage.

In addition, Chapter 1 explained why using the nonexperimental, ex post facto, quantitative survey was useful in cross-sectional survey studies when viewing attitudes and behavioral patterns. The nature of the study presented the method of inquiry and the significance of employing closed ended questioning when assessing human attitudes and

behaviors. Also listed in Chapter 1 were research questions, hypotheses and survey instruments utilized in the study. In the theoretical framework, Bandura's self-efficacy theory and its application to exercise were discussed. Key words in the definitions of terms for clarification purposes were presented. Next, a discussion of the assumptions, limitations and delimitations for this study were presented and mitigating solutions where applicable were offered. A discussion of positive social change implications, detailed significance of yoga as an effective adjunct therapy for individuals with SUD issues and the positive subsequent results on society were presented.

In Chapter 2 a review of the literature on the history of drug abuse, traditional treatment methods, alternative treatment methods, Bandura's self-efficacy theory and how the theory applies to yoga is discussed. Additionally, a robust discussion of yoga for substance-dependent individuals and the role of the treatment program in clinical therapy are offered.

Chapter 3 identifies the research design and methodology utilized to test the hypothesis in this study. This study utilizes a nonexperimental, ex post facto, quantitative methodology to determine variable strength in reference to substance dependence and exercise self-efficacy levels. Chapter 4 provides a detailed depiction of the study results and Chapter 5 provides recommendations in addition to plausible recommendations.

Chapter 2: Literature Review

Introduction

The purpose of this study was to address the ever-growing substance use disorder (SUD) issue, which continues to be problematic for communities across the United States and treatment professionals. This chapter offers discussions on the history and issues related to current, traditional, and alternative treatment methods for drug abuse in the United States. It also includes a discussions of SUDs and the relationship to yoga as an adjunct treatment program. To understand treatment alternative arguments, I present the comprehensive evidence obtained from a review of current studies. Additionally, a review of the literature benefits recent arguments on drug dependency in the United States. Further, discussions present arguments on the use of Bandura's self-efficacy theory related to exercise, and the efficacy of such intervention, showing benefit for the reduction of substance dependence. Finally, the chapter concludes with a summary of findings about the benefits of using the self-efficacy theory and the expected effects of utilizing yoga as an adjunct to substance abuse treatment, based on findings from the literature.

Literature Search Strategies

The literature review for this study included articles retrieved from online databases that were published primarily within the last five years. I selected articles from publications that were peer reviewed and pertinent to understanding the effects of exercise and self-efficacy for reducing substance dependence. Compiling information included utilizing the EBSCO database system to gather scholarly literature related to clinical psychology. The primary databases utilized for this research were (a) CINAHL,

(b) ERIC, (c) PsycARTICLES, (d) PsycBOOKS, (e) PsycINFO, and (f) SocINDEX. The key terms used in the search were: *exercise*, *relapse prevention*, *substance use disorders*, *alcohol*, *marijuana*, *poly-substance abuse treatment*, *self-efficacy*, *self-efficacy related to exercise*, *yoga*, *Surya Namaskar*, *habit formation*, *exercise self-efficacy*, *substance use disorders*, *alcohol use disorders*, *demographics and drug dependence*, *socioeconomic status*, and *treating drug addiction with exercise*.

Drug Abuse and Dependency

While drug dependence has been an issue of concern for thousands of years, the continued use of drugs in the United States appears to be influenced by environmental factors (Foo, Tam, & Lee, 2012). Song, Monroe, El-Demerdash, and Palmer (2014) stated that the modern use of weight loss drugs became a concern of abuse and subsequent addiction in the United States as early as the 1890s (Maisto, Galizio, & Connors, 2014). During the 1940s, several pharmaceutical companies promoted a generation of rainbow diet pills, named for their bright color, causing dozens of deaths by the 1960s (Cohen, Goday, & Swann, 2012). During the early 1970s, drug abuse was labeled as a national emergency by President Nixon and the U.S. Advertising Council ranked drug abuse as *public enemy number one* (Zarriello & Gray, 2014). At this time the causative nature of drug abuse was thought to be directly related to marijuana, which President Nixon termed a *gateway drug* designed to invade the middle class suburbs of America (Niesen, 2011). However, the root causes of drug abuse, such as poverty and unemployment were overshadowed paving the way for similar strategies and tactics of drug prevention campaigns for four decades (Davis & Grier, 2015). Later in the 1980s, President Reagan supported President Nixon's assessment of marijuana and created the

Just Say No and This Is Your Brain on Drugs campaigns along with the Advertising Council (Niesen, 2011).

The age of a substance-dependent individual has a significant impact on predictability of substance dependency hospitalization episodes (Giordano, Ohlsson, Kendler, Winkleby, Sundquist, & Sundquist, 2014). Gender and age are also significant factors: Substance addiction has a greater deleterious effects on men twice as much as women and three times as much for males under the age of 25 (McCabe et al. 2014). Foo, Tam, and Lee (2012) identified underlying dynamics and environmental factors taking place over an extended period, which are the causative factors for continued drug dependence.

Environmental factors are specifically prevalent in the inner cities giving rise to drug seeking behaviors as a way to cope with life stressors drastically effecting youth from low socioeconomic backgrounds (Wingo, Ressler & Bradley, 2014). The increased propensity of single parent homes, coupled with early exposure to drugs, exacerbates the cycle of drug dependence for inner city youth (Floyd, Alexandre, Hedden, Lawson, Latimer, & Giles, 2010). In a national study of 13,706 participants, Floyd et al. (2010) demonstrated that inner city Black adolescents were 29.7% more likely to engage in drug use and subsequent sales due to social and economic factors. Smith and Liu (2014) argued that traditional methods of treating drug dependence throughout the United States have been based on counseling and pharmaceutical intervention and have been ineffective for inner city youth.

Several studies have identified the importance of behaviors and habits on treating drug dependencies. Ibabe, Stein, Nyamathi, and Bentler (2014) described how regulation

of goal directed behaviors and self-incentives for personal change are enhanced through the incorporation of exercise in drug treatment programs. In a review of the literature Buchowski et al. (2011) found that 14 drug dependent adults who participated in an organized program for 10, 30-minute scheduled exercise sessions exhibited a reduction in use. Study participants also demonstrated a positive impact on mood and increased self-efficacy, which is an important factor in abstinence and the reduction of continued drug use (Buchowski et al., 2011). Brown et al. (2010) stated that while limited research presents evidence of the effects of exercise on drug dependency physical activity has a significant part to play as an adjunct treatment and recovery modality.

When the treatment of substance-dependent individuals incorporates alternative, adjunct treatment methods, such as exercise, the outcome elicits an enhanced sense of self, and promotes health and a feeling of accomplishment (Chen, Comerford, Shirrick, & Ziedonis, 2010). Chen et al. (2010) argued that the meditative effects of treatment methods such as exercise demonstrated a 92% completion rate; yoga may be of similar use. Addiction recovery and maintenance can be a very daunting experience for substance abusers and health care professionals (Frings & Albery, 2015). Therefore, the first step in adjunct therapy must focus on replacing addictive behaviors with alternative interests (Gregg & Jones 2014). Attaining the first step should incorporate finding new interests, such as hobbies or career interests, followed by the second step of engaging in exercise as a natural antidepressant (Mooney, Cooper, London, Chudzynski, & Rawson (2015). According to Wilson, Ellison, and Cable (2015), exercises treat the biological and psychological aspects of addiction. Exercise therapeutics that incorporate yoga elicit

antidepressant qualities; correct underlying cognitive physiology and social cognition; and reduce symptoms of depression (Wilson et al., 2015).

Self-Efficacy Theory

In presenting the self-efficacy theory in 1977, Bandura identified a missing element of existing learning theories (Zimmerman & Schunk, 2014). Self-efficacy materialized from several theories of psychology such as the social learning and cognitive behavioral theories (Bandura, 1997). Bandura (1997) studied how an individual's degree of personal control allowed for prediction of success. In addition, an area of concern was whether personal self-efficacy is compelled by an inborn drive, environmental influences or by the anticipated benefits (Bandura, 1997).

During the early years of life, an individual's degree of self-efficaciousness develops through parental guidance, beliefs and expectations, but quickly expands along with the child's social world (Plotnikoff, Gebel, & Lubans, 2014). Plotnikoff et al. (2014) argued that behavioral geneticists conclude that self-efficacious behavior is not only a state of mind but also a genetic predisposition. Bandura (1997) focused on the development of self-efficacy and the evolution of personal control through environmental influences. However, individuals circumvent control due to the effort needed to maintain self-proficiency by many conditions. According to Bandura (1997), individuals give up control over events in their lives to eliminate the demands that self-control require. Human behavior is not unidirectional but involves motivational beliefs according to Bandura (1997). According to Wood and Bandura (1989), human behavior is the result of unidirectional causation or one-sided determinism influenced by environmental factors or internal dispositions. In contrast, social cognitive theory depicts psychosocial functioning

in terms of triadic reciprocal causation indicating behavioral, cognitive, personal and environmental factors influence each other in a bidirectional manner (Wood & Bandura, 1989).

Bandura's (1989) description of motivational beliefs outlines how one's desire to change is composed of four processes of goal realization leading to self-efficacy. These processes consist of self-observation, self-evaluation, self-reaction and eventually self-efficacy (Plotnikoff et al., 2014). The first concept, self-observation consists of regularity and proximity factors and can inform and motivate (Bandura, 1991). Regularity simply means continued self-observance of one's behaviors while proximity relates to observance of a cognitive reflection of behaviors as they occur. The second concept, self-evaluation takes place when an individual compares current performance with desired goals indicating that goals must be specific to insure success. There are two types of self-evaluation consisting of absolute (a grading scale) and normative (social comparison) according to Bandura (1991). The third concept, self-reaction, can be motivational as positive self-reaction stimulates continued goal directed behaviors. In addition, negative self-reaction may also encourage persistence and an earnest desire to work harder towards achieving a desired goal. Lastly, self-efficacy can be the ultimate motivator as it enhances persistence towards challenging tasks (Bandura, 1991).

In the development of self-efficacy, individuals acquire a sense of self from environmental influences from caregivers and other social experiences at an early age (Plotnikoff et al., 2014). Through maturation, the individual begins to broaden social experiences by acquiring friends and acquaintances further developing the sense of self. Eventually the individual begins to evaluate and compare self, based upon social

experiences and either develops a robust sense of self or a perilous outlook on life (Reitz-Krueger, Nagel, Guarnera, & Reppucci, 2015). This self-evaluation consists of self-observation where an individual begins to undergo self-analysis in comparison to the social conformity. If one's social and environmental experiences have fostered a healthy sense of self, the outcome generally produces an efficacious individual (Di Giunta et al., 2015). In contrast, caustic social and environmental encounters have a greater propensity to elicit a deleterious long lasting effect (Rutkowski & Conelly, 2012).

Exercise Self- Efficacy

Applying self-efficacy theory to exercise reveals that self-regulatory skills are vital in the maintenance of healthy behaviors such as exercise (Kangas, Baldwin, Rosenfield, Smits, & Rethorst, 2015). Individuals develop a healthy mental attitude with respect to goal directed behavior by establishing goals, development of an action plan, self-monitoring, comparative feedback and personal adjustment (Plotnikoff et al., 2014). Goal prioritization is a key characteristic in order to manage conflict to accomplish a desired task (Plotnikoff et al., 2014). Inability to prioritize produces internal discord and subsequent impact to the pursuant of exercise goals (Vancampfort et al., 2015). Individuals who witness apathetic attitudes from primary care givers and other social experiences pertaining to exercise throughout developmental years are at increased risk of being sedentary throughout their adult lives (Plotnikoff et al., 2014).

Plotnikoff et al. (2014) s regulating control over one's self is imperative in the implementation and continuation of healthy behaviors. Goal directed behaviors are fueled by a regulation of the desire to attain a specific goal, which incorporates self-monitoring,

goal setting and incentives for goal attainment. Highly regarded incentives increase the propensity of effective goal directed behaviors (Hamburg & Pronk, 2015).

Plotnikoff et al. (2014) recruited 203 adult participants who volunteered to engage in the research project for two years. Roughly 38% of the participants were female, 62% were male, 90% Caucasian, 1% African American, 1% Asian, 2% other and 5% multicultural. Participants wore activity monitors for 1 to 3 weeks at a time to calculate the degree of physical activity. Study participants returned to the lab after having monitored their physical activity. Upon return, study participants were administered the Exercise Goal Setting Scale, Exercise Planning / Scheduling Scale, Exercise Self-Efficacy, Barriers Self-efficacy Scale, and Expectations for Exercise Sale. Results demonstrated that individuals with higher self-regulatory skills demonstrated efficacious behavior with respect to self-determination and motivation towards exercise (Rebar, Ram, & Conroy, 2014).

D'Abundo, Sidman, and Fiala (2014) demonstrated the relationship between exercise self-efficacy and perceived wellness. A total of 1,037 participants (46% male and 54% female) participated in a survey and were administered the Perceived Wellness Survey, Self-efficacy Scale, and the Exercise Habit Survey. Results of the study demonstrated that males exhibited a higher degree of wellness and an increased propensity to engage in and remain consistent with exercise behaviors. Such results may depict the fact that males have a greater tendency to engage in healthy sporting activities at a young age and may thereby continue such activities later in life (Li, Zayed, Muazzam, Li, Cheng, & Chen, 2015).

Self- Efficacy in Substance Abuse Treatment

As indicated by Foster, Yeung, and Neighbors (2014) exploring the concept of self-efficacy, as it relates to SUDs, determines if individual confidence and improved coping skills decrease drug-seeking behaviors. According to Majer, Olson, Komer and Jason (2015) individuals who exit substance abuse treatment programs with high abstinence specific self-efficacy exhibit lower, relapse rates in comparison to those with low self-efficacy. Zemore and Ajzen (2014) described how residential services, aftercare, job training, and behavior modification programs enhance self-efficacy fostering a healthy sense of self thereby reducing substance dependence relapse.

Zimmerman and Schunk (2014) described how abstinence specific self-efficacy can be predictive. A group of 897 adult participants from 214 Oxford House Treatment Centers volunteered to participate in a study designed to assess the self-efficacy in comparison to house level categories. House level categories were determined by the length of time in the treatment program. Age range of study participants ranged from 18 to 69 years with approximately 66% males and 34% females. Participants were administered the Alcohol Abstinence Self Efficacy and the Perceived Sense of Community Scale respectively. Results demonstrated a significant increase in self-efficacy levels corresponding to house levels. Specifically, higher house levels were indicative of increased responsibilities and subsequent increase in self-efficacy.

Exercise in Substance Abuse Treatment

Limited treatment approaches have also addressed the use of exercise in the treatment of addictions. Exercise, has rarely been implemented with such populations as an adjunct treatment for SUDs (Giesen, Deimel, & Bloch, 2015). Exercise intervention in

the treatment of SUDs not only promotes an overall healthy mood, but also improves coping ability, decreases stress reactivity and enhances self-efficacy (Mooney, Cooper, London, Chudzynski, & Rawson (2015). In a study designed to alter the behavioral and body image of drug dependent participants, Roessler (2010) enrolled 38 participants to engage in a three day per week exercise program lasting for six months. Results demonstrated that exercise treatment of drug dependent subjects proved to be a supportive method of adjunct treatment in maintaining behavioral changes.

Buchowski et al., (2011) argued that exercise training reduces cannabis cravings promoting enhanced self-efficacy. Fourteen cannabis dependent adults met the DSM-IV criteria for dependence and volunteered to participate in a study designed to determine the efficacy of exercise on substance dependence. Approximately 92% of the subjects were male and 8% female with an average age of 23 years respectively. However, none of the subjects showed interest in reducing use or seeking treatment. Study participants engaged in ten scheduled sessions over a ten-day period consisting of a 30-minute treadmill exercises conducted by an exercise physiologist. Participants were administered the Marijuana Craving Questionnaire after each session. Study results demonstrated that marijuana use was self reportedly reduced irrespective of the fact that participants were nontreatment seeking individuals. Despite the fact that this particular study was of a short duration the results exhibit potential for long-term benefits of extended exercise treatment programs.

Weinstock (2011) demonstrated the efficacy of exercise in the treatment of Alcohol Use Disorders (AUDs) by presenting evidence from a pilot study addressing the topic. In the randomized study on alcohol dependency, subjects placed into an exercise

intervention, did not incorporate a treatment control group. Individuals randomized to the exercise treatment component were engaged in supervised running three times per week for a total of eight weeks. Results of the study were indicative of the experimental group demonstrating not only a decrease in alcohol consumption, but also an increase in overall physical fitness (Weinstock, 2011).

According to Brown et al. (2010) treatment alternatives for individuals chronically addicted to alcohol, demonstrated promise with exercise implemented as an adjunct treatment. Study participants were twice as likely to alter their drinking habits within 6 to12 months after treatment in comparison to drinkers who received no physical intervention (Wilk, Jensen, & Havighurst, 2002). With respect to coping strategies, treatment subjects who participated in exercises such as deep breathing and meditation demonstrated a reduction in substance dependence as well as other psychological problematic issues 12-months following treatment (Brown et al., 2010). According to Smith and Lynch (2011) a reduction in exercise activities leads to an increase in substance use, suggesting that regular exercise may significantly assist in the reduction of SUDs (Mokhtarizaer, Ghodrati-Jaldbakhan, Vafaei, Milad-Gorji, Akhavan, Bandehgi, & Rashidy-Pour, 2014).

Consistent physical exercise can improve overall mood in individuals with AUD (Brown et al. 2010). Consistent exercise demonstrates a significant positive impact on mood. In addition, Read and Brown (2003) described how consistent exercise demonstrates positive results when compared with nontreatment control conditions. A specific study utilizing exercise to determine its efficacy with respect to SUDs was conducted using 58, randomly chosen, men and women receiving inpatient treatment.

Subjects equally divided into experimental and control groups for comparison demonstrated interesting findings. Experimental group subjects voluntarily engaged in a 6-week tailored exercise program consisting of calisthenics, running, stretching and walking. Study results demonstrated a significant difference with respect to abstinence of the experimental group subjects in comparison to controls. Control group subjects did not participate in exercise and demonstrated no change in alcohol usage.

Exercise in conjunction with motivational strategies, such as Motivational Interviewing (MI) when incorporated collectively with other treatment modalities, show promise with respect to reducing substance dependence (Gonçalves, Ometto, Bechara, Malbergier, Amaral, Nicastri, & Cunha, 2014). A study encompassing the use of alcohol among participants and the implementation of physical exercise in conjunction with MI was determined to have significant efficacy with respect to reduction in self-reported drinking. Subjects received random assignment to control and experimental groups. The experimental group incorporated the use of the decisional balance, which included importance, readiness and confidence with respect to establishing and maintaining sobriety in an effort to determine individual desire to establish sobriety (Cooper, 2012). In comparison, the control group did not incorporate the use of the decisional balance decreasing the overall desire to remain substance free and subsequent continued drug usage.

In a study to assess the effects of physical activity on alcohol usage, Leasure and Neighbors (2014) researched 198 high-risk individuals incorporating the UPP Impulsive Behavior Scale (UPPS-P) and the Behavioral Risk Factor Surveillance System (BRFSS). Subjects were randomized into an experimental design using computer-

generated numbers placing them in one of three categories consisting of brief consultation, sport and alcohol consultation, or a sport consultation in conjunction with an alcohol consultation along with a parental assessment (Werch, Moore, DiClemente, Owen, Jobli, & Bledsoe, 2003). Results of the study were indicative of no significant difference with regard to any of the measures of alcohol or drug use across groups due to inconsistent survey responses (Werch et al. 2003).

According to Brown et al. (2010) research efforts assessed the efficacy of brief moderate intensity exercise in the reduction of alcohol usage as well as ideations. The study consisted of 50 subjects currently undergoing alcohol detoxification. Study participants took part in a research project requiring them to self-report urges of alcohol usage following moderate intensity, group exercise. Randomly assigned groups ranged from 10 minutes of moderate intensity exercise (experimental group) to a very light intensity exercise (control group; Brown et al. 2010). The exercise tasks consisted of stationary cycling to a heart rate of 40-60% heart rate reserve (HRR) for the experimental group in comparison to a light intensity exercise at a heart rate of 5-20% HRR for the controls. Results of the study demonstrated no significant difference with respect to both groups at baseline. However, during exercise, results exhibited a significant decline in alcohol urge ratings in the moderate exercise group in comparison to the controlled group (Brown et al.).

Meek and Lewis (2014) demonstrated how individuals benefit from exercise and meditation to enhance coping strategies. For an 18-month period between mid-2004 and late 2005, 25 former heroin abusers were surveyed with respect to how they acquired abstinence. Approximately 60% of the participants were male and 40% female. Study

participants overwhelmingly described social stressors such an inability to secure employment and avoiding old drug acquaintances as being problematic, but found life style changes as being effective. Such life style changes included exercise and healthy eating habits, which promoted a desire to remain healthy (Meek & Lewis, 2014).

In an attempt to demonstrate, the efficacy of moderate exercise in marijuana dependence, Buchowski et al. (2011) conducted a study with 146 volunteer participants to address coping strategies and overall reasons for marijuana usage. Approximately 12 participants 8 females and 4 males respectively participated in a 2-week study designed to determine the effects of exercise on marijuana dependence. Participants were administered the Marijuana Craving Questionnaire. Results demonstrated that the short treatment period of 2-weeks is not a sufficient amount of time to address dependence indicating that longer treatment times are required to decrease dependence.

In a review of treatment programs targeted for the elderly, Briggs, Magnus, Lassiter, Patterson, and Smith (2011) described how prevention and early intervention programs that incorporated activities and adjunct exercise intervention demonstrated effectiveness in geriatric substance dependence. Specific areas were addressed, included alcohol and medication misuse, in addition to mood disorders. Review of the treatment programs demonstrated that 30 to 60 minutes of daily exercise decrease substance dependency, depression and other related disorders (Bartels, Blow, Van Citters, & Brockmann, 2006)

Two of the programs identified by Bartels et al. (2006) consisted of an exercise intervention program presented by a registered nurse, which included 30-60 minutes of supervised exercise focused on current exercise habits, alcohol and tobacco usage. The

exercise program consisted of 10 to 15 minutes of stretching, 20 minutes of walking, a cool down phase and an educational program. Results were indicative of the most favorable outcome coming from the combined effect of exercise and psychotherapeutic interventions such as problem solving and cognitive behavioral restructuring. Individual patterns of activity were assessed by administration of a three-part questionnaire gathering demographic, and fitness information for three generations of participants. Physical activity assessed by the recommended maintenance of healthy living as described by the US Department of Health and Human Services. Responses were determined on a three point Likert scale ranging from no activity to vigorous activity (Zach & Netz, 2007).

Zach and Netz (2007) surveyed three generations of participants to assess the generational effects of exercise habits. Approximately one third of the participants reported engaging in physical activity at irregular intervals (32.5% of the first generation, 30.4% of the second generation, and 37.3% of the third generation; Zach & Netz, 2007). Greater than a third of first-generation participants (36.9%) reported being active during the evening hours (44.9%). With regard to students, greater than one third participated in physical activity in the afternoon (36.6%; Zach & Netz, 2007). In an effort to assess, individual motives for physical activity subjects were given the Motives Questionnaire. Each generation exhibited results indicative of the strongest motive being “to feel better mentally and physically,” followed by “fun and enjoyment,” and finally to achieve a “better appearance” (Zach & Netz, 2007). Results demonstrated how environmental and social patterns exhibit influence on an individual’s motive throughout life to engage in healthy life style activities making adherence to adjunct yoga treatment a success.

Using the Physical Self-Perception Profile (PSPP), Taylor and Fox (2005) reported on their review of 36 participants who improved their overall well-being, body image satisfaction, and overall physical health through exercise. Some 142 participants were randomly placed in experimental and control groups for comparison. Both groups received literature on preventing chronic health disorders. Subjects were administered a short version of the PSPP to ascertain individual physical self-worth, physical conditioning, body appearance, and health by way of open-ended data collection. Results revealed that there might be several reasons as to why physical self-perception is the direct result of physical exercise. Physical self-perception appears to have some effect on an individual sense of mental well-being and may be the precursor for the motivation to engage in physical exercise. The factor of how one feels about success with respect to engaging in continuous physical activities is determined by environmental influences and life experiences (Vlachopoulos, Leptokaridou, & Fox, 2014). Individual self-concept of success, engagement in physical exercise and subsequent reduction in substance dependence is the primary reason why this study assessed the impact of self-efficacy as related to exercise (Maisto et al., 2015).

Van Hout and Phelan (2014) described how the effect of physical activity programs as an intervention to address SUDs demonstrates a significantly positive effect on a substance abusers physical and psychological health. While the intervention of physical activity may demonstrate significant results with respect to the treatment of addictions there have been relatively limited empirical descriptions of exercise benefits (Van Hout & Phelan, 2014).

According to the American Society of Addiction Medicine, physicians have recently defined addictions as having a close association with various potential neurobiological as well as psychological variables. These neurobiological and psychological variables contribute to addictive behaviors reinforcing brain rewards and related circuitry (Everitt, 2014). Neurobiological reinforcement associated with addiction is related to an increase in "dopaminergic activity" located in the reward centers of the brain (Everitt, 2014). Arnold and Salvatore (2015) stated that regular physical exercise enhances dopamine levels and attenuates age related disorder.

Causative factors associated with SUDs are directly related to low self-esteem and an external locus of control as well as inadequate coping (Mooney et al., 2014). While various studies show promise with regard to physical activity in the treatment of SUDs it is vitally important to determine which client's will be more receptive to the physical intervention that incorporates yoga as an adjunct treatment modality (Mooney et al.). In addition, it may be important for treatment modalities to implement individual treatment goals when incorporating yoga as an adjunct to treatment. Individual goal directed treatment modalities when working with SUDs details the importance of structured physical activity in treatment settings (Gellert, Ziegelmann, Warner, & Schwarzer, 2011).

Use of Yoga in Substance Dependence

The implementation of exercise has itself, not been incorporated in the treatment of SUDs, but yoga as a method of meditation has demonstrated limited use (Wittenauer, Ascher, Briggie, Kreiter, & Chavez, 2015). According to Young (2011), meditative practices are widely used in various treatment modalities. The meditative effects of yoga are associated with the development of a positive addiction and strengthening recovery

motivation. In addition to being a low cost supplement, meditative practices enhance greater psychological balance and well-being for individuals who have developed maladaptive coping responses to life stressors (Fishbein et al., 2015).

When the treatment of substance-dependent individuals incorporates alternative, adjunct treatment methods, such as yoga, the outcome elicits an enhanced sense of self, promotes health and a feeling of accomplishment (Chen, Comerford, Shirrick & Ziedonis, 2010). Chen et al (2010). argued that the meditative effects of treatment methods such as Surya Namaskar (SN) an ancient yoga method, demonstrated 92% completion of substance treatment. Pradhan (2015) described the safety and efficacy of yoga as an adjunct treatment program, making it a good choice for a low impact exercise. Pradhan (2015) also argued the cognitive and spiritual benefits as practitioners begin to experience increased self-awareness, concentration and a sense of well-being. Zhuang, An, and Zhao (2013) detail how a randomized trial of heroin addicts demonstrated improved mood status and quality of life after three months of adjunct yoga in comparison to control groups.

George and Amory-Reid (2015) described how individuals with SUDs develop enhanced coping skill techniques after engaging in weekly yoga sessions. According to Stoutenberg, Warne, Vidot, Jimenez, and Read (2015), individuals in residential treatment programs with SUDs reported improved health, enhanced self-esteem and confidence after engaging in yoga adjunct treatment. Addiction and subsequent continuation of drug seeking behavior is directly related to craving according to Kober and Mell (2015) and can be altered by implementing cognitive behavioral restructuring techniques incorporated through yoga. Groves and Farmer (1994) stated that yoga adjunct

treatment for addiction has a three-fold beneficial effect enhancing spiritual, emotional and physical imbalance.

Addiction recovery and maintenance can be a very daunting experience for substance abusers and health care professionals (Gotham et al., 2015). Therefore, the first step in adjunct therapy must be centered on replacing addictive behaviors with alternative interests (Randle, Stroink, & Nelson, 2015). Attainment of the first step should incorporate finding new interests, such as hobbies or career interests, followed by the second step of engaging in exercise such as yoga as a natural antidepressant (Randle et al., 2015). According to Curtis, Hitzig, Leong, Wicks, Ditor, and Katz (2015) exercises, such as yoga, treat the biological and psychological aspects of addiction. Depression is generally a precursor or aftereffect of drug usage, creating a dual diagnosis for medical professionals and can be addressed by implementing yoga adjunct treatment (Curtis et al., 2015). The yoga therapeutics with respect to antidepressant qualities corrects underlying cognitive physiology, social cognition and an overall enhancement of self-esteem (Curtis et al., 2015).

As described by Katzman et al. (2012) the yoga philosophy describes five primary causes of maladaptive coping responses described as the five keishas, which are the result of consciousness ignorance. The resultant effects of consciousness ignorance, as described by Katzman et al. (2012), is the direct result of how the brain processes information and attachment to ego craving. Ego craving, also defined as egoism, from a psychological perspective, describes human pursuits as the result of self-regard behaviors (Levit, 2015). According to the Buddhist philosophy, attachment to ego craving leads to dissatisfaction, mental agitation and suffering (Van Gordon, Shonin, & Griffiths, 2015).

As indicated by Mantsch et al. (2014) ineffective coping strategies are directly related to drug seeking behaviors. Wethington, Glanz, and Schwartz (2015) described how individual attitudes depict responses to life stressors and that negativity promotes significantly more stress than positivity. In addition, the level of stress is directly related to the quality of interpersonal relationships, amount of support from significant others, level of outside interest and physical activity according to Glanz and Schwartz (2015). For centuries, yoga has been shown to enhance mindfulness through meditation, reducing stress and developing effective coping skills while demonstrating lifestyle modifications (Posadzki, Choi, Lee, & Ernst, 2014).

As described by Sehgal (2015) the exercise philosophy describes maladaptive coping responses that are the result of consciousness ignorance. The resultant effects of consciousness ignorance, is the direct result of how the brain processes information and attachment to ego craving (Sehgal, 2015). Ego craving, also defined as egoism, from a psychological perspective, describes human pursuits as a result of self-regard (Levit, 2015).

Drug dependent individuals demonstrate emotional instability, poor mental and social health in addition to a poor attitude about overcoming stressors and addictive behaviors (Posadzki, Choi, Lee, & Ernst 2014). The implementation of exercises such as yoga, have been shown to assist in promoting emotional stability and replace the negative response to stressors for drug dependent individuals and promoting healthy life choices (Posadzki et al., 2014). Individual responses to the outside world and its associated stressors can prove to be overwhelming. Liang-wu, Jiang, and Wei (2015) described how the deep breathing and movement of yoga demonstrates efficacy in stress reduction,

overall flexibility and enhancement of stamina. Chronic exposures to stressful situations such as employment, relationships and physical ailments are precursors to addictive behaviors for individuals with poor coping skills (Liang-wu, Jiang, & Wei, 2015). Characteristics of inappropriate responses to stress are poor appetite, inability to focus and emotional outbursts all of which can be effectively addressed with yoga.

Criticism of Exercise

While prior research has shown the benefits of exercise, it has also identified exercise barriers as well (Cheifetz, Dorsay, & MacDermid, 2015). The consistency with respect to continued involvement in exercise related activities is dependent on the individual's desire and motivation to continue such programs (Strachan, Brawley, Spink, Sweet, & Perras, 2015). With respect to barriers to exercise individual fatigue level, discouragement from others and feelings of self-consciousness are primary reasons why individuals do not adhere to exercise regimens (Stults-Kolehmainen & Sinha, 2014).

Individual beliefs about one's capacity to deal with barriers to exercise are the primary reason why an exercise regimen may be ineffective (Mittal & Shank, 2015). How one perceives self is extremely important in all phases of making healthy behavioral changes. Renner, Spivak, Kwon, and Schwarzer (2007) assessed participants in two waves using the Health Action Process Approach (HAPA). Wave 1 consisted of 697 participants who also completed questionnaires at Wave 2, which was six months later. The average age of the participants was 32 years and a range of 16 to 90 years. Using the HAPA as a measure the study assessed for perceived risk factors believed to prohibit physical exercise. Results demonstrated that one's level of physical activity directly

related to social influences as well as leisure habits and not individual health concerns (Renner et al., 2007).

Individual perceived barriers to exercise might greatly affect an individual's desire and motivation to exercise, which is the determining factor as to why many people do not engage in such activities (Mittal & Shank, 2015). In the adult population, many individuals may see the primary barrier as being the lack of time. In an attempt to identify exercise barriers in adult women, Kang, Zhu, Ragan, and Frogley (2007) administered a 23-item Barrier Instrument to 479 female adult participants that demonstrated the lack of self-discipline, lack of time and the lack of a specific block of time as being barriers to exercise. Discussion from focus groups indicated that the lack of a specific place to exercise in addition to safety concerns were paramount and were among the concerns of older adult women (Kang et al., (2007).

Summary and Transition

This chapter provided a review of the literature related too current traditional and alternative treatment modalities for SUDs. The chapter described how individuals with substance dependence histories are relapsing at high rates (Dart et al., 2015). In an effort to reduce the relapse rate, the chapter detailed how community based treatment programs are in need of adjunct interventions to help substance-dependent individuals' complete treatment programs. The chapter further described how the implementation of yoga in community-based treatment programs are productive methods of continued treatment in an effort to reduce substance dependence (Brown & Gerbarg, 2015). In addition, the chapter pointed out the importance of aftercare programs as they incorporate individualized alternative treatment methods, as current modalities have proven to be

minimally effective (Smith & Liu, 2014). The chapter detailed how Smith and Liu argued that evidence based practice has been implemented in substance abuse settings providing more training and support for professionals in the field when compared to traditional treatment methods, which have not always been researched based.

The chapter also described how Sharma (2014) details the effectiveness of yoga in reducing stress levels after 30 days of treatment. The chapter continued by indicating how Khalsa, Greiner-Ferris, Hofmann and Khalsa (2014) described yoga as it enhanced cognitive behavioral therapy and demonstrated success in the treatment of patients suffering from anxiety, depression, panic and sleep disorders. The chapter detailed how yoga therapy also demonstrated effectiveness in developing coping strategies and overall stress management techniques (Villacres, Jagannathan, Nagarathna, & Ramakrsihnal, 2014). The chapter detailed how Villacres et al. (2014) argued the causative factor of all psychological disturbances as mentally entrenched due to dysfunctional coping strategies. Young (2011) identified in this chapter and described the effectiveness of yoga as a combined community based service in the treatment of Substance Use Disorders (SUDs). The current study investigated the perceived effect of yoga as an adjunct treatment for substance use.

The present study filled the gap in the literature with respect to the efficacy of yoga as an adjunct treatment modality to enhance treatment effectiveness for SUDs by incorporating the ESE and TEA to determine treatment effectiveness. This study extended knowledge in the discipline of clinical psychology and the treatment of SUDs by introducing alternative methods to treatment effectiveness. Such programs could

prove to be an excellent method of enhancing overall self-efficacy, improving stress management, anxiety reduction, and leading to enhanced treatment effectiveness.

Chapter 3 identifies the research design and methodology utilized to test the hypothesis in this study. This study utilized a classic quasi-experimental design known as nonequivalent group design (NEGD) requires evaluating changes in self-efficacy and treatment effectiveness for both treatment and comparison groups. Chapter 4 provides a detailed depiction of the study results and Chapter 5 provides recommendations in addition to plausible recommendations.

Chapter 3: Research Methods

Introduction

This chapter discusses the research methodology, design, and the intervention implemented for the study. Additionally, the chapter details the sampling procedures, sample design and sample selection process. Arguments on the required sample size, data collection procedures, data organizations techniques, and measures to ensure reliability and validity of the instrument are all included.

Research Design

This study conducted a classic quasi-experimental, nonequivalent groups design (NEGD) to evaluate changes in self-efficacy and treatment effectiveness for both treatment and comparison groups. The survey compared drug dependent treatment facilities that incorporated yoga as an adjunct treatment method to facilities that did not incorporate yoga. The findings of the study were descriptive in nature on which future surveys may build. The aggregate of 10 scale scores from the Treatment Effectiveness Assessment (TEA) was the dependent variable, consisting of three subscales (Health, Lifestyle, and Community) and the total score. Exercise self-efficacy was the independent variable, consisting of six subscales (Negative Affects, Excuse Making, Must Exercise Alone, Inconvenient to Exercise, Resistance from Others and Bad Weather).

A classic quasi-experimental approach was used because the survey was comparative in nature. The comparative approach examined mean differences among variables and predicted the dependent variable (treatment effectiveness) from the independent variable (exercise self-efficacy). A complete packet consisting of consent

forms, the TEA, and the ESE was placed in a centralized location at each research site for interested participants who then placed the completed packets in a locked drop box to insure anonymity.

Research Questions and Hypotheses

1. Do patients who engage in adjunct yoga exercise have increased substance abuse treatment effectiveness?
    - Hypothesis 1_0: Patients who engage in adjunct yoga exercise do not have increased substance abuse treatment effectiveness.
    - Hypothesis 1_a: Patients who engage in adjunct yoga exercise have increased substance abuse treatment effectiveness.
2. Do patients who engage in adjunct yoga exercise have increased self-efficacy?
    - Hypothesis 2_0: Patients who engage in adjunct yoga exercise do not have increased self-efficacy.
    - Hypothesis 2a: Patients who engage in adjunct yoga exercise have increased self-efficacy.
3. Does adjunct yoga exercise moderate the relationship between patient self-efficacy and substance abuse treatment effectiveness?
    - Hypothesis 3_0: Patients who engage in adjunct yoga exercise do not have higher levels of self-efficacy and do not demonstrate a strengthening of the relationship between yoga and treatment effectiveness.
    - Hypothesis 3a: Patients who engage in adjunct yoga exercise have higher levels of self-efficacy and demonstrate a strengthening of the relationship between yoga and treatment effectiveness.

Sample Design and Size

A power analysis, utilizing GPower3 software, was performed to ascertain the appropriate sample size for this study. An aprioi power analysis, assuming a large effect size (*f* = .50), a = .05, indicating a minimum sample size of 33 required to achieve a power of .95. The use of a large effect size (*f* = .50) was the most appropriate for this study. According to Berry, Crowe, Deane, Billingham and Bhagerutty (2010) the average effect size for relapse prevention treatment of drug abusers is .44 to .70 respectively.

However, a convenience sampling procedure was used in the recruitment of survey participants using a participant pool from south-central and southwestern portions of the United States. A large enough sample size consisting of 100 study participants each were recruited for both yoga and nonyoga treatment groups. Phakiti (2015) recommended a minimum of 30 participants for correlation studies. Shondrodt (2013) argued that correlation studies with less than 80 participants are not very stable and stability increases with sample sizes of 100-120 participants. Therefore, this study utilized a sample size of 100 participants for each yoga and nonyoga group to increase stability. The use of an effect size (*f* = .20) was the most appropriate for this study. With respect to sample justification, Cohen (1992) described effect sizes from small if they are 0.02, medium if they are 0.15 and large if they are 0.35 respectively. The effect size is chosen so as to decide how small of a difference will be acceptable to determine if the results are worthwhile. Large sample sizes are required if the sample size is small while requiring large constitute smaller sample sizes.

According to O'Connell, Kasprow, and Rosenheck (2013), individuals who reported high levels of alcohol and drug usage (as determined by the Addictions Severity

Index) demonstrated an average effect size ranging from .19 to .33, respectively. In a study assessing the main effect of substance dependency levels and time in treatment O'Connell et al. (2013) identified varying levels of alcohol and drug use behaviors. In addition, the study also assessed initial substance use interactions and pretreatment resulting in an effect size ranging from .32 to .22 respectively. In comparison, substance-dependent individuals who spent some time in residential treatment facilities prior to receiving additional treatment, but with more drug use experience, demonstrated effect sizes ranging from .19 to .58 respectively (O'Connell et al., 2013).

Recruitment Procedures

The population for this study included individuals who have voluntarily admitted themselves into a substance abuse treatment facility in the south-central region of the United States. Recruitment time took approximately three weeks to acquire enough participants to conduct the survey. Eligibility for inclusion in the study consisted of individuals currently enrolled in a substance abuse treatment program that utilized yoga as an adjunct to treatment. Survey participants from the yoga facility were compared to participants from another facility in the southern region of the country that utilized traditional substance abuse treatment methods. Participants who met the criteria were allowed to retrieve the informed consent form, information packet, and instructional flyer from centralized locations at each facility.

I contacted the director of the treatment facility to inquire about recruiting individuals who expressed an interest in documenting progress throughout treatment. Data collection began on 3/7/2016 after I received an approval from the Walden University Institutional Review Board (IRB) approval number: 03-10-16-0111300,

expiration date: March 9, 2017. Upon authorization, research flyers (Appendix A) and the consent form (Appendix B) were placed in centralized locations at each facility. Flyers were numbered, which was the only system used to identify participants in records. In addition, the informed consent clarified to participants that they would not be compensated for participation. Survey participants were informed that they had the right to withdraw from the survey and decline to complete the survey at any time. Staff members informed interested participants that flyers, consent forms, and surveys were placed in a centralized location and were to be placed in a secured locked box to ensure anonymity upon completion.

Instrumentation

I used a combination of two inventories in this, which included both the TEA and ESE. The TEA and ESE instruments have been used in a wide variety of clinical settings. The following section covers the nature of each instrument, its administration, validity, and reliability.

Treatment Effectiveness Assessment

Ling, Farabee, Liepa, and Wu (2012) described the TEA as a product of the 2010 Affordable Care Act to measure substance dependence. The TEA is a 4-item, self-report questionnaire developed to assess treatment effectiveness. Participants taking the TEA report treatment effectiveness at baseline and after completion of treatment to compare effectiveness of a substance abuse program. The TEA's three subscales relate to four types of situations (Substance Use, Health, Lifestyle and Community). The survey employs a Likert response format ranging in 1-point increments from 0 (*non or not at all*) to 10 (*much better*).

Ling et al. (2012) described the psychometric properties of the TEA. In previous analysis of the TEA, Ling et al. (2012) utilized large samples of two different national multisite studies across a mixed sample of alcohol, amphetamine, cannabis, cocaine opiates and sedatives. Psychometric analysis demonstrated that asking more questions on a survey does not demonstrate reliable results, as some questions are uninformative and redundant (Wu et al., 2012). The findings suggest that the TEA is a reliable and valid indicator of treatment effectiveness in substance abuse settings. Participants taking the TEA report treatment effectiveness before and after treatment relating to (Substance use, Health, Lifestyle and Community).

The field of substance addiction and recovery has sought efficient but comprehensive assessment tools to determine treatment effectiveness. As indicated by Ling et al. (2015), the TEA has a demonstrated reliability and validity with respect to assessing changes taken place due to treatment pertaining to family relationships, housing and employment. Ling et al. (2015) stated that the Affordable Care Act (ACA) implemented in 2010 stipulated the importance of addiction treatment and the development of brief instruments to assess treatment effectiveness. The Substance Abuse and Mental Health Services Administration (SAMHSA) in 2012 outlined four major components that constitute a life of recovery (Ling et al. 2015). Life components consisting of improvement in health, home, purpose and community were identified by SAMSA as important factors to determine the degree of substance dependence recovery resulting in the development of the TEA.

The TEA assesses the extent of improvement after treatment intervention. Each inventory was utilized to collect data pertinent to the participants using a Likert scale,

which yields a high degree of precision in retrieving information that the measures are purported to measure (Hoch et al., 2014). Participants who volunteered completed both the ESE (Appendix C) and the TEA (Appendix D). Ling et al. (2012) described the psychometric properties of the TEA in their use of large samples of two different national multisite studies across a mixed sample of alcohol, amphetamine, cannabis, cocaine opiates and sedatives. The psychometric analysis determined that surveys with extensive questioning exhibit poor reliability, as questions tend to be redundant (Wu et al., 2012). Findings detail that the TEA is a reliable and valid indicator of treatment effectiveness in substance abuse settings.

Scoring of the TEA measure was accomplished by taking the three categories (list categories) scored on a 10-point scale (1–10) and adding the total. Scores ranged from 3–30, with high scores indicating high levels of treatment effectiveness. Higher scores on the TEA were indicative of higher levels of treatment effectiveness and lower levels of dependency while lower scores indicated a decrease in treatment effectiveness and higher levels of dependency (Lundqvist, Benth, Grande, Aaseth, & Russell, 2011). Example TEA items:

1. How much better are you with drug and alcohol use?
2. Has your health improved?
3. How much better are you in taking care of your personal responsibilities?
4. Are you a better member of the community?

Exercise Self-Efficacy Survey

The ESE was designed to assess confidence with respect to exercise adherence. The six-item scale has an alpha of .87 to .89 indicating good internal consistency. A

convenience sample of survey participants currently undergoing treatment were recruited from treatment centers that used yoga as an adjunct treatment method and compared to treatment centers that did not incorporate yoga. The survey was designed to identify the effectiveness of treatment centers that utilized yoga as an adjunct treatment in comparison to facilities that did not incorporate yoga as an adjunct to treatment (Nessen, Demmelmaier, Nordgren, & Opava, 2015). Example ESE items:

1. Negative Affects: I am under a lot of stress. I am depressed. I am anxious.
2. Excuse Making: I feel I do not have the time. I do not feel like it. I am busy.
3. Must Exercise Alone: I am alone. I have to exercise alone. My exercise partner decides not to exercise today.
4. Inconvenient to exercise: I do not have access to exercise equipment. I am traveling. My gym is closed.
5. Resistance from others: My friends do not want me to exercise. My significant other does not want me to exercise. I am spending time with friends or family who do not exercise.
6. Bad weather: It is raining or snowing outside. It's cold outside

High scores on the ESE demonstrate increased levels of self-efficacy while low scores exhibit low self-efficacious behavior with respect to exercise (Van der Heijden, Pouwer, & Pop, 2014). The original Exercise Self-Efficacy Survey (ESE) consists of six items that are gathered using a rating of 0–100 with zero indicating an inability to perform the task (not at all confident) to 100 indicating certainty with regard to performing the task (highly confident; Van der Heijden et al., 2014). Resnick and Jenkins (2000) described how the initial reliability and validity of the ESE was assessed using

187 male and female adults. Sufficient evidence was presented detailing internal consistency with an alpha level of 0.92. Evidence of validity was also demonstrated by hypothesis testing. Internal reliability and validity was demonstrated with respect to the ESE utilizing a sample of 305 adults ranging in age from 18 to 46 years. The ESE demonstrated good reliability and discriminant validity with respect to physical activity indicating that self-efficacy may exhibit important implications with respect to physical exercise. The ESE instrument has been mostly used in athletic settings to enhance strategies for optimal performance (Feltz, Short, & Sullivan, 2008). According to a study conducted Chow and Wong (2014) the ESE demonstrated reliability for assessing adult respondents ranging in age from 21-65 who engaged in planned physical activity. In addition, Annesi and Gorjala (2010) reported the instrument to have an internal reliability of .82 with a test-retest reliability of .90. According to Armitageet al., (2014) the ESE demonstrated internal validity of 0.88 when assessing beliefs toward exercise. The ESE also demonstrated test validity as a series of expert reviews and cognitive interviews were conducted.

The 6-item ESE instrument has an alpha of .87 to .89 indicating good internal consistency. A convenience sample of survey participants currently undergoing treatment were recruited from treatment centers that used yoga as an adjunct treatment method and compared to treatment centers that did not incorporate yoga. The survey was designed to identify the effectiveness of treatment centers that utilized yoga as an adjunct treatment in comparison to facilities that did not incorporate yoga as an adjunct to treatment (Nessen, Demmelmaier, Nordgren, & Opava, 2015). Scoring the ESE instrument was accomplished by summing up the scores for each individual item. Scores ranged from 6-

30, with high scores indicating higher levels of self-efficacy. The remaining two items each consisted of three response categories and were scored on a 5-point scale (1-5) and adding the total.

The ESE and TEA scales were dependent variable measurement tools designed to assess several aspects of self-efficacy and the degree of substance treatment effectiveness. Specific instructions were provided to the participants on the research flyers as indicated in the protocol (Appendix D). In addition, research flyers and measurement tools were written at a low grade level for ease of comprehension. In reference to the Exercise Self-Efficacy Survey, Kangas, Baldwin, Rosenfield, Smits, and Rethorst (2015) described how the ESE was designed to assess the effectiveness of exercise over a 30-day period. The Treatment Effectiveness Assessment (TEA) is a tool designed to assess the effectiveness of treatment throughout various stages of treatment or after the treatment has been completed according to Ling, Farabee, Liepa, and Wu (2014).

Data Collection

Study participants were asked to participate in a survey to assess their knowledge of the effect of self-efficacy on treatment effectiveness. A large enough sample size consisting of 100 study participants were recruited for both yoga and nonyoga treatment groups. Surveys were utilized as data collection instruments for this study. To reduce the inherent errors associated with surveys, I evaluated nonresponsive patterns, which may have had a potential to affect interpretation of the findings. In addition, a clear guideline for missing data was discussed prior to the administration of the surveys by facility staff members.

According to Creswell (2009) surveys are very economical and provide for a rapid turnaround of collected data. The surveys utilized in this research were rapidly administered with the ESE and TEA taking approximately 5 minutes too complete. The reliability and validity of the use of surveys in research is very effective in gathering data. Wyse (2012) describes how the use of surveys has led to more effective quantitative research analysis. In addition to being effective research tools, surveys are useful in describing characteristics of a given population and are flexible and dependable (Wyse, 2012). Surveys are easily administered with respect to obtaining information from multiple participants. However, the disadvantage of using surveys may put a strain on validity, as participants may not provide accurate demographic or characteristics information.

Data Analysis

I used descriptive statistical methods and the SPSS software version 24.0 to process and analyze data. Descriptive statistics included a master record of completed surveys along with a research identification number (i.e., 1, 2, 3), which was assigned to each completed packet. The instruments used in this study had very few items. Items missing on the TEA or ESE constituted exclusion from the study. Information gathered from demographic data consisting of age, race, and educational level were considered predictor variables.

Inferential statistical methods using analysis of covariance (ANCOVA) and *t*-test were used to assess the four items on the TEA and the six items on ESE respectively and determine relative strengths of scores obtained from combinations of the TEA and ESE surveys. Wu and Lai (2015) described the effectiveness of ANCOVA as demonstrating

increased accuracy in controlling the nominal significance level. The ANCOVA is also more powerful than its ANOVA counterpart when dependent variables and covariates are correlated (Wu & Lai, 2015). As described by Wu and Lai (2015), ANCOVA based on normal score transformation is robust for data distribution as it preserves the nominal significance and has good statistical power. ANCOVA was conducted to examine the differences in the linear combination of the four items on the TEA (Substance use, Health, Lifestyle, Community) and the six items on the ESE (Negative Affects, Excuse making, Must Exercise Alone, Inconvenient to Exercise, Resistance from Others and Bad Weather).

A MANCOVA was utilized to look at the main effects, while including covariates. Additionally, a multivariate multiple regression was also conducted, which eliminated the need for a *t* test as the MANCOVA and regression were sufficient, which decreased the risk of a family-wise error. The *p* values, *F* and R^2 were used to assess Hypothesis 1, 2 and 3 (yoga exercise and treatment effectiveness (DV); yoga exercise and self-efficacy (DV); yoga exercise, self-efficacy, and their interaction with treatment effectiveness (DV) respectively. The *F*-test was used to determine the significance of the r-square and overall model. The regression analysis also included age, race, and education level to control for their potential influence. A significance level of .05 was utilized to assess and determine significance for each of the parameter estimates in the regression model for their influence on the dependent variable.

Protection of Participants

I took several steps to ensure that the rights of survey participants were protected. First, I obtained written consent from the participants who took part in the study. Second,

the confidentiality of all participants was maintained, as the surveys packets were placed in a locked box only accessible to me. Third, the informed consent clearly outlined that all participants were to be voluntary and were aware that compensation would not be provided for individual effort and time. This nonmenacing approach to research participation allowed me to ensure voluntary participation. While the anticipation of distress was difficult to discern during the study, I was able to reduce such risks by referring participants to an outside mental health hotline if needed.

Debriefing did not take place in this study as such procedures would have potentially caused harm to the participants. Survey participants were fully informed in writing before they consented to participate. As indicated by Gibson, Beegle, De Weerdt and Friedman (2015) deception has potentially devastating effects on survey participant's attitudes toward a study after learning about their gullibility.

Summary and Transition

This study utilized a quantitative classic NEGD quasi-experimental design using a between subject's design to evaluate changes in self-efficacy and treatment effectiveness as respectively indicated by ESE and TEA scores. This quantitative study examined the relationship between variables, a dependent variable (Treatment Effectiveness) and independent variable (Exercise Self-Efficacy). The measures consisted of (a) the TEA and the (b) ESE. According to Ling et al. (2015) the TEA was developed as a result of the Affordable Care Act (ACA) implemented in 2010 to address the need of identifying substance abuse issues in medical settings. The ESE is grounded in Bandura's (1977) self-efficacy theory and is based on a six-category classification of relapse prevention.

Descriptive analysis was conducted including age, race, and education level (e.g., frequencies, means, percentages, and standard deviations as appropriate; Mundt, Gregory, Melzi, & McWayne, 2015). The standard deviation determines statistical dispersion and was implemented to determine the spread of values in the data collected (McLean, Su, & Foa, 2015). The collected data was recorded and analyzed using the SPSS version 22.0 for Windows. The ANCOVA was used to assess the 4 subscales on the TEA and 6 subscales on the ESE to determine if there was a difference between scale scores. A linear regression analysis was utilized to determine the relationship between the dependent variables and independent variables

Chapter 3 provided a detailed description of the discussions on the research methodology, design, and the intervention implemented for the study in addition to the research design. The chapter also provided an explanation of the population and sampling to include sample design, size, recruitment procedures, instruments used, data collection, analysis and protection of participants. Chapter 4 provides a detailed depiction of the study results and Chapter 5 provides recommendations in addition to plausible recommendations.

Chapter 4: Results

Introduction

The purpose of this survey research was to assess the impact of yoga as a moderator on substance abuse treatment effectiveness. The Treatment Effectiveness Assessment (TEA), a patient-oriented assessment instrument designed to assess treatment response, was used to acquire the research data for this study (Ling, Farabee, Liepa & Wu 2012). In addition, based on the self-efficacy model, the Exercise Self Efficacy (ESE), a self-administered survey designed to assess behavioral and situational components related to exercise maintenance, was used to collect research data for this study (Yeh, Mu, Davis & Wayne 2016). This study incorporated the self-efficacy theory as the theoretical foundation, examining various influential factors of adherence to exercise for the adults with substance abuse histories in the population (demographics, age, ethnicity, and education level). A convenience sample of participants was obtained through volunteers at the Cheyenne Center and the 180 House substance abuse treatment facilities; data were collected from 200 survey respondents. This chapter presents a review of the research questions and hypothesis, followed by the statistical analysis of the collected data. Analysis of the data is as follows: descriptive statistics, MANCOVA, multivariate regression, and a summary.

Sample Demographics

Study participants were residents from the Cheyenne Center and the 180 House substance abuse treatment facilities that volunteered to participate in the research. All study participants were diagnosed as having substance abuse / dependency issues prior to having been voluntarily assigned or court mandated to the treatment facility. A

convenience sampling strategy was utilized to recruit 100 voluntary yoga and nonyoga participants from each substance abuse treatment facility.

Descriptive Statistics

Between March 10, 2016 and June 1, 2016, 200 individuals completed the survey. All respondents eligible for inclusion accessed the survey from the centralized location at their respective treatment facilities. Respondents were asked to reply to four questions on the TEA and six questions on the ESE. Table 1 shows the descriptive statistics with respect to age, ethnicity, and education of respondents on both the TEA and ESE survey assessments overall and by the control and treatment groups. None of the respondents provided responses that were missing data, resulting in 100% inclusion in the statistical analysis.

The four questions on the TEA were:

1. How much better are you with your drug and alcohol use?
2. Has your health improved?
3. How much better are you in taking care of personal responsibilities?
4. Are you a better member of the community?

Respondents were asked to record their answers using a Likert scale ranging from a low of 1 to a high of 10. The scores were summed and categorized as follows: low (4–15), moderate (16–28), and high (29–40).

The six prompts on the ESE were:

1. Negative effects of exercise while under stress, depression or anxiety,
2. Making excuses to exercise when you don’t have the time, don’t feel like it, or too busy.

3. Must exercise alone, have to exercise alone, and exercise partner does not want to exercise that day
4. Inconvenient to exercise without equipment, traveling, or gym is closed.
5. Resistance from others when friends don't want to exercise, significant other does not want to exercise, or spending time with family or friends who do not exercise.
6. Bad weather when it's raining, too cold outside, or the roads / sidewalks are wet.

The scores were summed and categorized as follows: low (18–41), moderate (42–65), and high (66–90). On the TEA, the 41 nonyoga Black respondents had a mean score of, 27.98 (SD=7.25) on the TEA. The Hispanic nonyoga respondents consisted of 25 individuals who exhibited a mean score of 25.96 and *SD* of 7.14 on the TEA. Asian (Other) nonyoga respondents consisted of 5 individuals who exhibited a mean score of 24.0 and *SD* of 13.34 on the TEA. The White nonyoga respondents consisted of 29 individuals, with a mean score of 28.83 and *SD* of 9.29 on the TEA. On the TEA, there were 25 Black yoga respondents, with a mean score of 22.72 and *SD* of 12.04. There were 5 Asian (Other) yoga respondents, with a mean score of 28.60 and *SD* of 8.85 on the TEA. There were 51 White yoga respondents, with a mean score of 26.90 and *SD* of 10.95 on the TEA.

There were 63 *high school and below* yoga respondents, with a mean score of 26.21 and *SD* of 11.15 on the TEA. The 37 college yoga respondents had a mean score of 27.76 and *SD* of 9.86 on the TEA. The 46 respondent aged 35 or less had a mean score of 25.78 and a *SD* of 11.98. The 37 respondents ranging in age from 36 to 50 years had a mean score of 27.24 and a *SD* of 10.06. The last group consisted of 17 respondents ranging in age 51 and above exhibited a mean score of 28.47 and a SD of 8.17.

Table 1

Descriptive Statistics (Age, Ethnicity & Education)

		Treatment Effectiveness Assessment		Exercise Self-Efficacy	
Characteristic	*n*	*M*	*SD*	*M*	*SD*
Control (Nonyoga)					
Race					
Black	41	27.98	7.25	46.63	19.02
Hispanic	25	28.96	7.14	46.60	20.27
Asian (Other)	5	24.00	13.34	33.00	13.71
White	29	28.83	9.29	50.97	19.86
Education					
High School and Below	88	28.43	7.42	44.66	18.1
College	12	27.08	12.65	65.83	19.85
Age					
<= 35	34	29.53	7.74	43.21	20.09
36 – 50	43	29.37	8.04	44.77	17.14
51+	23	24.35	8.04	57.65	19.77
Total	100	28.27	8.15	47.20	19.48
Experimental (Yoga)					
Race					
Black	25	22.72	12.04	56.68	25.32
Hispanic	19	31.32	6.07	58.37	23.54
Asian (Other)	5	28.60	8.85	47.60	30.51
White	51	26.90	10.95	50.29	22.66
Education					
High School and Below	63	26.21	11.15	50.95	25.13
College	37	27.76	9.86	57.27	21.14
Age					
<= 35	46	25.78	11.98	54.85	26.07
36 - 50	37	27.24	10.06	52.76	21.04
51+	17	28.47	8.17	50.24	24.18
Total	100	26.78	10.67	53.29	23.82
Overall					
Race					
Black	66	25.98	9.61	50.44	21.99
Hispanic	44	29.98	6.73	51.68	22.27
Asian (Other)	10	26.30	10.94	40.30	23.59
White	80	27.60	10.36	50.54	21.57

Descriptive Statistics (Age, Ethnicity & Education)

	Treatment Effectiveness Assessment			Exercise Self-Efficacy	
Characteristic	*n*	*M*	*SD*	*M*	*SD*
Education					
High School and Below	151	27.50	9.20	47.28	21.46
College	49	27.59	10.47	59.37	20.96
Age					
<= 35	80	27.38	10.5	49.90	24.28
36 - 50	80	28.39	9.03	48.46	19.34
51+	40	26.10	8.25	54.50	21.78
Total	200	27.53	9.50	50.25	21.92

With respect to the ESE, the 41 nonyoga Black respondents had a mean score of score of 46.63 and *SD* of 19.02; the 26 Hispanic nonyoga respondents had a mean score of 46.60 and *SD* of 20.27. The 5 Asian (Other) nonyoga respondents had a mean score of 33.00 and *SD* of 13.17; the 29 White nonyoga respondents had a mean score of 50.97 and *SD* of 19.86 on the ESE.

In regards to age, respondents were divided into 3 groups: less than 35, 35 to 50, and ≥51 years of age. A total of 34 respondents of age 35 or less presented, with a mean score of 43.21 and a *SD* of 20.9. The 43 respondents ranging in age from 36 to 50 years had a mean score of 44.77 and a *SD* of 17.14. The 23 respondents who were ≥51 years of age had a mean score of 57.65 and a SD of 19.77 on the ESE.

The 88 High School and Below group nonyoga respondents had a mean score of 44.66 and *SD* of 18.10. The 12 College nonyoga respondents had a mean score of 65.83 and *SD* of 19.85 on the ESE. With respect to the ESE, the 25 Black yoga respondents had a mean score of 56.68 and *SD* of 25.32 on the ESE. The 19 Hispanic yoga respondents

had a mean score of 58.37 and *SD* of 23.54 on the ESE. The 5 Asian (Other) yoga respondents had a mean score of 47.60 and *SD* of 30.51 on the ESE. The 51 White yoga respondents had a mean score of 50.29 and *SD* of 22.66 on the ESE.

The 63 High School and Below group yoga respondents had a mean score of 50.95 and *SD* of 25.13 on the ESE. The 37 College group yoga respondents had a mean score of 57.27 and *SD* of 21.14 on the ESE. Forty-six respondents of age 35 or less presented with a mean score of 54.85 and a *SD* of 26.07. Thirty-seven respondents ranging in age from 36 to 50 years exhibited a mean score of 52.76 and a *SD* of 21.04. The last group consisted of seventeen respondents ranging in age 51 and above exhibited a mean score of 50.24 and a SD of 24.18.

Table 2 shows descriptive statistics with respect to control versus experimental groups in reference to ethnicity and education level and how they differed on the TEA and ESE assessment surveys. With respect to TEA, 23 respondents exhibited low scores consisting of 7 control and 16 experimental participants. 64 respondents had moderate scores consisting of 37 control and 27 experimental participants. 113 respondents had high scores consisting of 56 control and 57 experimental participants. With respect to race/ethnicity, 23 respondents exhibited low scores on the TEA consisting of 9 Black participants, 1 Hispanic participant, 2 Asian (Other) participants and 11 White participants, 64 respondents exhibited moderate scores on the TEA consisting of 24 Black participants, 15 Hispanic participants, 2 Asian (Other) participants and 23 White respondents, 113 respondents exhibited high scores on TEA consisting of 33 Black participants, 28 Hispanic respondents, 6 Asian (Other) respondents, and 46 White respondents. With regards to education level 23 respondents exhibited low scores on the

TEA consisting of 15 High School and Below participants and 8 College participants, 64 respondents exhibited moderate scores on the TEA, 53 High School and below and 11 College participants. A total of 113 respondents exhibited high scores on the TEA consisting of 83 High School and below participants and 30 College participants. With respect to age 23 respondents exhibited low scores on the TEA consisting of 11 participants in the age group of 35 years and less, 8 participants between the ages of 36 to 50 years old and 4 participants ranging in age of 51 and older. A total of 64 respondents exhibited moderate scores on the TEA consisting of 21 participants in the age group of 35 years and less, 23 participants between the ages of 36 to 50 years old and 20 participants ranging in age of 51 and older. A total of 113 respondents exhibited high scores on the TEA consisting of 48 participants in the age group of 35 years and less, 49 participants between the ages of 36 to 50 years old and 16 participants ranging in age of 51 and older.

With respect to the ESE, 71 respondents exhibited low scores consisting of 41 control and 30 experimental participants. Seventy-four respondents had moderate scores consisting of 41 control and 33 experimental participants. Fifty-five respondents had high scores consisting of 18 control and 37 experimental participants. With respect to race/ethnicity, 71 respondents exhibited low scores on the ESE consisting of 26 Black participants, 13 Hispanic participant, 5 Asian (Other) participants and 27 White participants. Seventy-four respondents exhibited moderate scores on the ESE consisting of 20 Black participants, 17 Hispanic participants, 3 Asian (Other) participants and 34 White respondents. Fifty-five respondents exhibited high scores on ESE consisting of 20 Black participants, 14 Hispanic respondents, 2 Asian (Other) respondents, and 19 White respondents. With regards to education, level 71 respondents exhibited low scores on the

ESE: 62 High School and below participants and 9 College participants, 74 respondents exhibited moderate scores on the ESE, 53 High School and below and 19 College participants. A total of 55 respondents exhibited high scores on the ESE consisting of 36 High School and below participants and 19 College participants. With respect to age 71 respondents exhibited low scores on the ESE consisting of 32 participants in the age group of 35 years and less, 28 participants between the ages of 36 to 50 years old and 11 participants ranging in age of 51 and older. A total of 74 respondents exhibited moderate scores on the ESE consisting of 25 participants in the age group of 35 years and less, 34 participants between the ages of 36 to 50 years old and 15 participants ranging in age of 51 and older. A total of 55 respondents exhibited high scores on the ESE consisting of 23 participants in the age group of 35 years and less, 18 participants between the ages of 36 to 50 years old and 14 participants ranging in age of 51 and older.

Table 2

Descriptive Statistics (Groups)

	Treatment Effectiveness Assessment (Group)						Exercise Self-Efficacy (Group)					
	Low		Moderate		High		Low		Moderate		High	
	n	*%*	*n*	*%*	*n*	*%*	*n*	*%*	*n*	*%*	*n*	*%*
Treatment Group												
Control (Nonyoga)	7	30.4	37	57.8	56	49.6	41	57.7	41	55.4	18	32.7
Experimental (Yoga)	16	69.6	27	42.2	57	50.4	30	42.3	33	44.6	37	67.3
Race/Ethnicity												
Black	9	39.1	24	37.5	33	29.2	26	36.6	20	27	20	36.4
Hispanic	1	4.3	15	23.4	28	24.8	13	18.3	17	23	14	25.5
Asian (Other)	2	8.7	2	3.1	6	5.3	5	7	3	4.1	2	3.6
White	11	47.8	23	35.9	46	40.7	27	38	34	45.9	19	34.5
Education Level												
High School and Below	15	65.2	53	82.8	83	73.5	62	87.3	53	71.6	36	65.5
College	8	34.8	11	17.2	30	26.5	9	12.7	21	28.4	19	34.5
Age												
<= 35	11	47.8	21	32.8	48	42.5	32	45.1	25	33.8	23	41.8
36 - 50	8	34.8	23	35.9	49	43.4	28	39.4	34	45.9	18	32.7
51+	4	17.4	20	31.3	16	14.2	11	15.5	15	20.3	14	25.5

Research Questions and Hypotheses

The three research questions in this study hypothesized that individuals with substance abuse disorders who engaged in adjunct yoga exercise would demonstrate higher levels of self-efficacy on the ESE and increased treatment effectiveness on the TEA compared to individuals who did not engage in adjunct yoga exercise after controlling for demographics, age, ethnicity and education level. In addition, the third research question hypothesized adjunct yoga exercise moderates the relationship between individual self-efficacy and substance abuse treatment effectiveness.

1. Do patients who engage in adjunct yoga exercise have increased substance abuse treatment effectiveness?
    - Hypothesis 1_0: Patients who engage in adjunct yoga exercise do not have increased substance abuse treatment effectiveness.
    - Hypothesis 1_a: Patients who engage in adjunct yoga exercise have increased substance abuse treatment effectiveness.
2. Do patients who engage in adjunct yoga exercise have increased self-efficacy?
    - Hypothesis 2_0: Patients who engage in adjunct yoga exercise do not have increased self-efficacy.
    - Hypothesis 2a: Patients who engage in adjunct yoga exercise have increased self-efficacy.
3. Does adjunct yoga exercise moderate the relationship between patient self-efficacy and substance abuse treatment effectiveness?

- Hypothesis 3_0: Patients who engage in adjunct yoga exercise do not have higher levels of self-efficacy and do not demonstrate a strengthening of the relationship between yoga and treatment effectiveness.
- Hypothesis 3a: Patients who engage in adjunct yoga exercise have higher levels of self-efficacy and demonstrate a strengthening of the relationship between yoga and treatment effectiveness.

Statistical Analysis

In an effort to assess the magnitude and effect of demographics on the dependent variables MANCOVA was examined (see Table 3). There was no significance with respect to the demographic variables other than education on the dependent variables. As demonstrated by the results the intercept is the best estimate of the TEA and the parameter was significant, $B = 28.368$, $t(189) = 9.327$, $p < .001$. Due to this, only a small proportion in the variability of TEA can be explained by the demographic variables in the model ($R^2 = .003$). As demonstrated, the regression model for ESE had a significant finding for education level, confirming the results of the MANCOVA. The amount of variation explained is still low ($R^2 = .049$). The point estimate for the slope of having a high school diploma or less shows an average decrease on the ESE with all other variables held constant, $B = -10.80$, $t(189) = -2.88$, $p = 0.004$. Table 4 shows the full results and parameters of the study and details of the MMR.

With respect to the first research questions and hypothesis, “Do patients who engage in adjunct yoga exercise have increased substance abuse treatment effectiveness?”, the results indicated a relationship with ethnicity indicating that Hispanic and Asian (Other) respondents presented with higher mean scores on the TEA thereby

rejecting the null hypothesis. In reference to the second research question, “Do patients who engage in adjunct yoga exercise have increased self-efficacy?”, the results indicated a relationship with higher levels of education (College) thereby rejecting the null hypothesis. With regards to the third research question and hypothesis, “Does adjunct yoga exercise moderate the relationship between patient self-efficacy and substance abuse treatment effectiveness?”, the results indicated no relationship in reference to self-efficacy and treatment effectiveness thereby accepting the null hypothesis.

Table 3

MANCOVA Results

Source		*SS*	*df*	*MS*	*F*	*p*	η2
Treatment Group	Treatment Effectiveness Assessment	153.21	1	153.21	1.70	0.193	0.009
	Exercise Self-Efficacy	801.61	1	801.61	1.76	0.186	0.009
Race	Treatment Effectiveness Assessment	391.48	3	130.49	1.45	0.230	0.022
	Exercise Self-Efficacy	1510.63	3	503.54	1.11	0.348	0.017
Education	Treatment Effectiveness Assessment	8.84	1	8.84	0.10	0.754	0.001
	Exercise Self-Efficacy	3788.05	1	3788.05	8.31	0.004	0.042
Age	Treatment Effectiveness Assessment	98.79	2	49.39	0.55	0.578	0.006
	Exercise Self-Efficacy	779.35	2	389.67	0.86	0.427	0.009

Table 4

Parameter Estimates

Dependent Variable		*B*	*SE*	*t*	*p*	η2
Treatment Effectiveness Assessment	Intercept	25.96	1.98	13.12	0.000	0.473
	Control Group	1.88	1.44	1.30	0.193	0.009
	Experimental Group	Reference Group				
	Black	-1.97	1.64	-1.20	0.233	0.007
	Hispanic	1.83	1.84	1.00	0.320	0.005
	Asian (Other)	-1.47	3.19	-0.46	0.647	0.001
	White	Reference Group				
	Education: High School or Less	-0.52	1.66	-0.31	0.754	0.001
	Education: College	Reference Group				
	Age: <=35	1.40	1.87	0.75	0.454	0.003
	Age: 36-50	1.95	1.87	1.05	0.297	0.006
	Age: 51+	Reference Group				
Exercise Self-Efficacy	Intercept	62.76	4.45	14.09	0.000	0.508
	Control Group	-4.29	3.24	-1.33	0.186	0.009
	Experimental Group	Reference Group				
	Black	3.26	3.70	0.88	0.379	0.004
	Hispanic	3.98	4.13	0.96	0.336	0.005
	Asian (Other)	-8.07	7.19	-1.12	0.263	0.007
	White	Reference Group				
	Education: High School or Less	-10.80	3.75	-2.88	0.004	0.042
	Education: College	Reference Group				
	Age: <=35	-3.92	4.20	-0.93	0.351	0.005
	Age: 36-50	-5.49	4.21	-1.30	0.194	0.009
	Age: 51+	Reference Group				

a. *R* Squared = .038 (Adjusted *R* Squared = .003)
b. *R* Squared = .085 (Adjusted *R* Squared = .052)

In reference to dependent variables, neither age nor ethnicity demonstrated significance with respect to treatment effectiveness or exercise self-efficacy. Regarding

education, respondents with college experience were significantly higher on ESE and TEA.

With respect to correlations between groups, there was no significant relationship between TEA and ESE for the control (nonyoga) group, $r(98) = .193$, $p = .054$, but there was a positive relationship found in the experimental (yoga) group, $r(98) = .240$, $p = .016$. The findings, while minimal, provide evidence in regards to the hypothesis that individuals who engage in adjunct yoga exercise exhibit a higher score on treatment effectiveness.

Table 5

Test of Moderation

		Moderator Effect	
Characteristic	R^2	R^2 *Change*	*p*
Treatment Group	0.005	0.001	0.669
Race			
Black	0.057	0.007	0.223
Hispanic	0.06	0.007	0.213
Asian	0.003	0.001	0.784
Caucasian	0.003	0.000	0.940
Education Group	0.045	0.014	0.086
Age			
<=35	0.043	0.001	0.635
36-50	0.051	0.000	0.852
51+	0.052	0.000	0.904

A moderator analysis was conducted to determine whether the relationship between TEA and ESE depends on the value of a demographic variables. Demographics were converted into dichotomous variables and passed through a hierarchical linear regression to determine potential moderation effects based on significant changes to the coefficient of determination. Based on the change seen in each model, no demographic variable showed a significant moderating effect between TEA and ESE ($p > .05$).

Table 6

Group Statistics

Groups	*n*	*M*	*SD*	*t*	*p*
Treatment Effectiveness Assessment				1.110	0.268
Cheyenne Center	100	28.27	8.15		
180 House	100	26.78	10.67		
Exercise Self-Efficacy				-1.979	0.049
Cheyenne Center	100	47.20	19.48		
180 House	100	53.29	23.82		

A two-sample *t* test was conducted to determine if a difference existed between the two centers that were involved in the study. For TEA, no significant difference was found between the Cheyenne Center (*M = 28.27, SD = 8.15*) and 180 House (*M = 26.78, SD = 10.67*), t(185) = 1.110, p = .268. However, for ESE, Cheyenne Center (*M = 47.20, SD = 19.48)* and 180 House (*M = 53.29, SD = 23.82*) did have significantly different scores, *t*(190) = -1.979, *p* = .049.

Summary and Transition

The current study's three-research questions hypothesized that individuals who engaged in adjunct yoga exercise would demonstrate higher scores on TEA and ESE than individuals who had not engaged in adjunct yoga exercise. The statistical analysis of the current study's data demonstrates no significance with respect to adjunct yoga exercise on TEA and ESE. As a result, only a small portion of the TEA was explained by the demographic variables in the model. On the other hand, the regression model for ESE had a significant finding for education level, confirming the results of the MANCOVA. While the amount of variation explained is still low (R^2 = .049) the point estimate for the slope of having a high school diploma or less shows an average decrease on the ESE with all other variables held constant. The moderator analysis demonstrated no significant effect between TEA and ESE once demographics were converted into dichotomous variables and passed through a linear regression based on changes to the coefficient. Previous studies have exhibited robust relationships between individuals engaged in long term adjunct exercise program lasting for six months with respect to age and education level. Interactions with those covariates were investigated indicating a slight effect with respect to education above the high school level.

Chapter 5 details the study limitations, implications for social change and recommendations with respect to application of the findings for future research.

Chapter 5: Discussion Recommendations, and Conclusions

The primary purpose of this study was to assess the impact of adjunct yoga exercise on Treatment Effectiveness Assessment (TEA) and Exercise Self Efficacy (ESE) scores. The intent of the study was to expound on the existing knowledge, information and data available on the topic of yoga and its effectiveness in enhancing treatment outcomes for substance-dependent individuals while promoting social change through evidenced-based practices no relationship was determined to be significant between TEA and ESE for the nonyoga group, but a statistically significant relationship was found in the yoga group with respect to education beyond high school. The findings, while minimal, provided evidence in regards to the hypothesis that individuals who engage in adjunct yoga exercise will exhibit a higher score on treatment effectiveness when looking at age levels.

Only a small portion of the TEA could be explained by the demographic variables in the model, but a significant correlation was found between education and ESE. The results of demographics as it relates to TEA and overall treatment effectiveness implies that problem recognition in addition to treatment engagement may have been compromised during treatment decreasing the overall effectiveness of their individual programs from the beginning. While the overall number of participants with education levels beyond high school was relatively low, the correlation between education and ESE implies a tendency towards the self-reflective behavior of exercise as related to education level.

This concluding chapter presents a brief overview of the study and an interpretation of the findings with respect to the existing literature. Recommendations for

action, study limitations, recommendations for further study, implications for social change, and conclusions are included.

Interpretation of the Findings

With respect to Hypothesis 1, study respondents reported treatment effectiveness and exercise self-efficacy of their program during the last week of treatment. While controlling for age, ethnicity, and education a significant relation was only observed between yoga exercise and education level, treatment seen between adjunct yoga exercise, and substance abuse treatment effectiveness. However, a slight relationship was identified between age groups and treatment effectiveness. For Hypothesis 2, while controlling for age, ethnicity and education level, significant findings were only discovered for education with respect to adjunct yoga exercise and self-efficacy. In reference to Hypothesis 3, while controlling for age, ethnicity, and education level, no support for moderation effect of yoga practice on self-efficacy and treatment effectiveness was discovered.

The regression model for ESE had a significant finding for education level. While the amount of variation explained was still low (R^2 = .049), the point estimate for the slope of having a high school diploma or less showed an average decrease on the ESE with all other variables held constant. This suggests that education is a significant factor in an individual's decision to engage in self-destructive behaviors. These research findings were consistent with previously published studies. For example, Fishbein et al. (2016) found that significant effects were not demonstrated for hypothesized self-regulations measures indicating further research should use larger sample sizes. According to Carim-Todd, Mitchell, and Oken (2013), larger sample sizes and carefully monitored treatment interventions need to be employed in order to determine the overall and long-term benefits of yoga on treatment effectiveness.

Education level demonstrated a positive association among respondents on ESE. College-level respondents rated their ability to engage in therapeutic exercise higher than individuals with lower levels of education. Education has been shown to have a significant impact on exercise self-efficacy, as demonstrated by survey research of 100 participants who participated in a 12-week study (Yeh, Mu, Davis, & Wayne, 2016). Education has also been significantly correlated with increased self-efficacy scores (Yeh et al., 2016). The results of the current study demonstrated similar results. In an effort to assess potential differences in the experimental and control group with respect to TEA and ESE, MANCOVA was utilized while controlling for race, education, and age. In addition, a multivariate multiple regression was conducted. The correlation demonstrated that when ESE increases, so does TEA only in the yoga group.

Study results demonstrated that the yoga group participants exhibited slightly higher levels of ESE and subsequently increased TEA scores indicating a slightly positive correlation between exercise self-efficacy and treatment effectiveness. Damush et al.'s (2016) 12-month trial of 250 primary care patients found that the patients exhibited increased self-efficacy scores and subsequent enhanced treatment effectiveness with respect to musculoskeletal pain management. Further, Lam, Li, Chiu, and Chan (2016) found a positive correlation between exercise self-efficacy and treatment effectiveness in a study of 76 oncology patients.

Recommendations for Action

The results of the current research suggest that adjunct yoga exercise does not have a significant positive impact on substance abuse treatment effectiveness; however, I suggest future studies to expand upon this research. Dissemination of significant findings

of future research should be focused on reaching local, state, and federal substance abuse treatment facilities and health care providers in addition to educational institutions and professional organizations to eradicate the global substance abuse pandemic. While the results of this study did not demonstrate significance of yoga in treatment outcomes, the implementation of yoga as an adjunct treatment may prove beneficial in individuals with higher levels of education when conducted over a longer duration.

Further research should consist of longitudinal studies designed to assess long-term treatment effectiveness using yoga as an adjunct treatment and determining the overall effect on exercise self-efficacy and treatment effectiveness. Such research should consist of a minimum of a 10-year longitudinal study designed to determine if adjunct yoga treatment in conjunction with simultaneous continued substance abuse education and academic achievement positively affects treatment outcomes

Study Limitations and Recommendations for Future Study

Limitations of the current study included (a) social desirability bias with respect to education level indicating a greater degree of ESE and TEA results due to what is socially acceptable of individuals with higher levels of education and (b) limited research regarding the effectiveness of ESE on TEA results. The aforementioned limitations with Assessing the Impact of Yoga as a Moderator on Substance Abuse Treatment Effectiveness were addressed in two recommendations detailed below.

The current study was dependent on respondents to be forthright with respect to detailing their age, ethnicity, and education level as well as ESE and TEA. According to Zestcott, Blair, and Stone (2016), asking individuals to report their attitudes is a flawed approach because people are unwilling to provide socially undesirable responses about

themselves and report only what is expected socially. According to Lai et al. (2016) people hold biased attitudes without being cognizant of their feelings in many cases resulting in implicit bias on surveys. Such behavior may have affected the current study by the expectation of respondents to be forthright resulting in implicit bias. Compulsory drug treatment may have been another limitation to the current study as some of the respondents were possibly mandated by the courts, or required to complete treatment by family members. As noted by Werb, Kamarulzaman, Meacham, Rafful, Fischer, Strathdee, and Wood (2016), compulsory drug treatment in general does not result in improved outcomes, eliciting biased results when testing outcomes.

Recommendation 1: Reducing Social Desirability Bias

Reduction of this type of bias is accomplished by implementing indirect questioning methodology that could reduce the occurrence of respondent providing socially desirable responses. Dalal and Hakel (2016) detailed that indirect questioning resulted in higher reporting of truthful responses. Reduction of socially desirability bias is done by ruling out alternative explanations according to Dalal and Hakel (2016). Indirect questions are disguised, which do not allow the respondent to determine what is being measured. Esponda, Huerta, and Guerrero (2016) described indirect questioning as information reduction techniques requiring less information from the individual surveyed. Surveys of this nature are de-sensitized, allowing respondents to provide unbiased information without fear (Esponda, 2016). This particular technique would have been effective for this study as a means of reducing the social desirability bias of respondents.

Recommendation 2: Limited Research Regarding the Effectiveness of ESE on TEA Results

Further research could be done with respect to determining the overall effect of individual participation of adjunct yoga exercise, responses on the ESE and subsequent responses of the TEA. The results of the current study determined a relationship between education with respect to TEA and ESE. Future studies should therefore concentrate on determining the results of longitudinal research in order to take a close look at developmental trends and life events affecting treatment outcomes. The overall benefits of yoga are exhibited after long-term treatment as described by Hernández et al. (2016) eliciting a plethora of healthy cognitive and physical effects, including a reduction in substance use disorders. I recommend that future studies utilize the Quality of Life Questionnaire (EORTC QLQ-C30), which may prove to be more sensitive to exhibiting some degree of change after yoga intervention. The variables utilized in this study (age, ethnicity, and education) may not have been sensitive enough to have been influenced by yoga intervention.

Implication for Social Change

The pandemic of drug abuse in the United States continues to worsen as new designer drugs and the introduction of other pharmaceutical agents continue to exact a devastating toll on society (McBride, Terry-McElrath, & VanderWaal, 2016). While the results of this study demonstrated no statistical significance in reference to using yoga as an adjunct treatment for drug abuse, the accumulation of knowledge in reference to what works versus what does not work can contribute to existing knowledge in the treatment of drug addiction. Ersche et al. (2016) argued that prior research postulated behavioral

intervention consisting of positive reinforcement and punishment, resulted in clients becoming insensitive to the consequences of their actions leading to the addictive behavior having no positive impact and concluding that punishment does not work in addiction. According to Jewell, Rose, Bush, and Bartz (2016), prior studies also argued the effectiveness of Drug Treatment Courts (DTCs) indicating that while promising results were demonstrated, further research was needed. Such evidence solidifies the fact that the accumulation of knowledge with respect to effective versus noneffective methods of treatment is vital in gaining a better understanding of treating addiction.

As detailed by Herzberg, Guarino, Mateu-Gelabert, and Bennett (2016) governmental policies with respect to the advent of pharmaceutical and designer drugs continue to follow the same patterns as demonstrated for more than a century. A shifting from educational campaigns, reduction of drug supply and harm reduction has been the pattern of political concern, but only a combination of all three approaches can exhibit a reduction in drug related harm (Herzberg et al., 2016). Myers, van der Westhuizen, Naledi, Stein, and Sorsdahl (2016) stated that in regards to social change, the substance-abusing individual must be ready to implement a life change. Motivation is the key factor for eliciting individual change according to Myers et al. (2016).

There are many social risk factors intensifying the pervasive nature of drug use and dependence (El Rawas & Saria, 2016). If the social environment can elicit a negative effect, changing one's social environment to consist of stress reduction, positive peer encounters, and strong family attachment will in turn facilitate healthy social change and subsequent reduction in substance use (El Rawas & Saria, 2016). A sedentary lifestyle leads to a myriad of physical, mental and social complications that increase the

propensity of individuals with poor coping skills to succumb to drug use and dependence (Hoeger & Hoeger, 2016). The current research while minimally expanded the body of knowledge directed at detailing the benefits of adjunct yoga activity and subsequent increase in treatment effectiveness; it enhanced knowledge of overall health and benefits of exercise as related to drug addiction. Continued research will eventually lead to advancements in the area of substance abuse treatment with the potential of saving as well as enhancing the quality of life for all humanity.

Conclusion

This study did not identify any no correlation between a substance abusers' involvement in adjunct yoga exercise, as described from scores on the ESE, and subsequent treatment effectiveness, as demonstrated by TEA scores. This finding did not support Manthou et al. (2016) statements that exercises such as yoga, if maintained, elicit beneficial physiological and psychological effects that have lasting results. This is the primary reason why it is my suggestion that future studies look at the longitudinal effects of yoga with respect to TEA and ESE. The psychological mechanism of exercise is explained from the psychological domain of Bandura's self-efficacy theory indicating that as human beings people cannot regulate their own behavior (Manthou et al., 2016). From a physiological perspective, Manthou et al. (2016) indicated that yoga exercise elicits a euphoric effect improving overall mood and increasing endorphin levels.

The current study furthers the advance and understanding of the impact of yoga exercise but demonstrated no increase in treatment effectiveness and therefore recommends that future studies expand upon the research. Expansion of the current study should include a thorough investigation of substance abuse treatment facilities,

implementation of yoga as an adjunct treatment methodology and subsequent scores on the TEA over a longer duration. In addition, further research will be needed to assess the population's education level to determine if higher education levels exhibit a true correlation with ESE and subsequent TEA scores. Finally, it is recommended that survey questions be of an indirect nature to eliminate the possibility of socially desirable responses from respondents.

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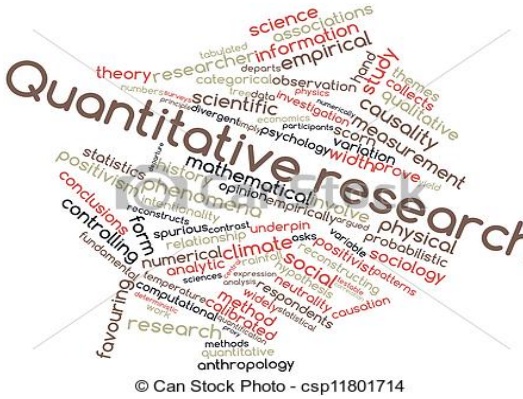
Appendix A: Research Announcement

SURVEY ANNOUNCEMENT



ATTENTION!

Do you want to know how yoga can help you stop using drugs or alcohol? Anyone interested in participating in the survey being done by Joe McDaniel? Please see the below information about the date, time, and place of the survey. If you have any questions, please feel free to call me at (832) 244-8769.

DATE: September 2, 2016

TIME:

LOCATION:

Thank you in advance for your interest. I look forward to seeing you!

Appendix B: Consent Form

Consent Form

Do you want to know how yoga can help you stop using drugs or alcohol? If you are between the ages of 18 and to 65, you are just right for this study. Completing the survey is part of the informed consent and lets me know that you agree to be a part of this study. Joe McDaniel, a student at Walden University, is doing this study.

Background Information:

The purpose of this survey is to test how yoga will reduce drug or alcohol use.

Procedures:

If you agree to be in this survey, you will be asked to:

- Read this consent form carefully and ask Joe McDaniel any questions you may have.
- **DO NOT PLACE YOUR NAME ON ANY OF THE DOCUMENTS GIVEN TO YOU.**
- **ONLY COMPLETE THE SURVEY IF YOU ARE IN THE LAST 2 WEEKS OF YOUR PROGRAM.**
- **DO NOT COMPLETE THE SURVEY IF YOU HAVE FELT DOWN, SAD OR DEPRESSED FOR THE LAST 2 WEEKS.**
- **DO NOT COMPLETE THE SURVEY IF YOU ARE SEEING A PSYCHIATRIST FOR A MENTAL PROBLEM.**
- **DO NOT RETURN THIS FORM; KEEP IT FOR YOUR RECORDS.**
- The yoga treatment may or may not be a part of your program.
- If yoga is not a part of your program, you will be used to compare to the yoga group. This will allow me learn more about programs that will help in substance dependence.
- Complete an 8-question exercise survey (this will take about 10 minutes) and will test your ability to continue an exercise program. This will be done at the end of your program. Examples of questions are the negative effects of exercise like being depressed and under stress. Making excuses, being too busy, not having time and bad weather are other examples.
- Complete a 4-question survey on treatment effectiveness (this will take about 5 minutes) and will test changes in substance use, health improvements, lifestyle changes and community. This will be done at the end of your program. Examples of questions are improved health, lifestyle and community involvement.
- You will put the completed surveys in a locked box to make sure your information is confidential.

Voluntary Nature of the Study:

Your participation in this survey is voluntary. This means that everyone will respect your decision to participate or not. No one will treat you differently if you do not want to be a part of the survey. Also, you can change your mind during the survey at any time. If you do not feel good about any part of this survey, you may stop at any time. You have the right to skip any questions that you feel are too personal. Please do not complete the survey if you have felt down, sad or depressed for the last 2 weeks. Do not complete the survey if you are seeing a psychiatrist for a mental problem.

Risks and Benefits of Being in the Survey:

The risks of this survey are minimal. You may experience some feelings associated with answering the questions. If so, please contact this free 24-hour crisis hotline at (844) 398-8252. The benefit of taking this survey will help me understand if yoga helps build confidence and reduce drug and alcohol use. This will help people with drug and alcohol issues improve their lives.

Compensation:

PLEASE NOTE: Your agreement to take this survey says that you are aware that there WILL BE NO FORM of payment or goods for taking the survey.

Confidentiality:

Any information you give will be confidential. Your will never be asked for your signature. Your completion and return of the surveys will be your agreement to participate. Your name will not be used. Your age and race will be the only way to identify you. Your information answers will only be used is used for this research project.

Contacts and Questions:

If you have any questions later, you may contact me at the number at (832) 244-8769. If you want to talk privately about your rights as a participant, you can contact me at the number provided or call **Dr. David Mohr** at Walden University. He is the Walden University representative who can discuss this with you. His phone number is 1-800-925-3368 extension 312-1210. If you feel down, sad or depressed after completing the survey contact this free 24-hour crisis hotline service at (844) 398-8252 if needed. Walden University's approval number for this study is **03-10-16-0111300** and it expires on **March 9, 2017.**

The researcher will provide you with a copy of this form to keep for your records.

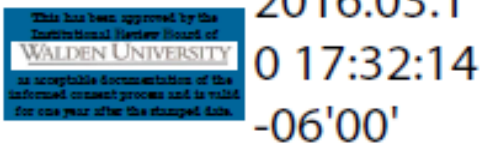
Statement of Consent:

I have read and understand the study and would like to take the survey. I understand you do not need my signature. I agree to all terms by completing the surveys and returning them to the researcher.

Researchers Written or Electronic Signature Joe MacDaniel

Notification of Electronic Signatures

The Uniform Electronic Transactions Act regulates electronic signatures. Legally, an "electronic signature" can be the signatory typed name, email address, or any other identifying markers. An electronic signature is as valid as a written signature as long as both parties have agreed to conduct the transaction electronically



Appendix C: Treatment Effectiveness Assessment (TEA)

Age: _____

Race / Ethnicity: _____

Education Level: _____

Directions. The TEA asks you to report changes for the better from your involvement in the program to this point in four areas: substance use, health, lifestyle, and community. For each area, think about how things have become better and circle the answer on the scale below: the more you improved, the higher the number – from 1 (not better at all) to 10 (very much better). In each area write down the one or two changes most important to you in the remarks section. Feel free to use the back of this page to add details, explain remarks, and make comments.

1. **Substance use:** How much better are you with drug and alcohol use? Consider how often, amount of use, money spent on drugs, time spent being high, being sick, in trouble and in other drug-using activities, etc.

None or not at all **Better** **Much better**

1 2 3 4 5 6 7 8 9 10

Remarks:

---

2. **Health:** Has your health improved? In what way and how much? Think about your physical and mental health: Are you eating and sleeping properly, exercising, taking care of health problems or dental problems, feeling better about yourself, etc?

None or not at all **Better** **Much better**

1 2 3 4 5 6 7 8 9 10

Remarks:

3. **Lifestyle:** How much better are you in taking care of personal responsibilities? Think about your living conditions, family situation, employment, relationships: Are you paying your bills? Taking care of yourself?

None or not at all				**Better**					**Much better**
1	2	3	4	5	6	7	8	9	10

Remarks:

4. **Community:** Are you a better member of the community? Think about things like obeying laws and meeting your responsibilities to society: Do your actions have negative or positive impacts on people?

None or not at all				**Better**					**Much better**
1	2	3	4	5	6	7	8	9	10

Remarks:

Appendix D: Exercise Self-Efficacy Scales

Directions. This survey has six questions that look at how confident you are at exercising when other things get in the way. Please read each question carefully and respond as honestly as possible as it relates to your leisure time.

Use the following Scale and circle the correct response

1 = Not at all confident

2 = Somewhat confident

3 = Moderately confident

4 = Very confident

5 = Completely confident

Negative Affects

I am under a lot of stress.	1	2	3	4	5
I am depressed.	1	2	3	4	5
I am anxious.	1	2	3	4	5

Excuse Making

I feel I don't have the time.	1	2	3	4	5
I don't feel like it.	1	2	3	4	5
I am busy.	1	2	3	4	5

Must Exercise Alone

I am alone.	1	2	3	4	5
I have to exercise alone.	1	2	3	4	5
My exercise partner decides not to exercise that day.	1	2	3	4	5

Inconvenient to Exercise

I don't have access to exercise equipment.	1	2	3	4	5
I am traveling	1	2	3	4	5
My gym is closed	1	2	3	4	5

Resistance from Others

My friends don't want me to exercise	1	2	3	4	5
My significant other does not want me to exercise.	1	2	3	4	5
I am spending time with friends or family who do not exercise.	1	2	3	4	5

Bad Weather

It's raining.	1	2	3	4	5
It's cold outside.	1	2	3	4	5
The road or sidewalks are wet.	1	2	3	4	5