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Effect of Mindfulness-Based Stress Reduction on Aggression in Adults with Intellectual Disabilities

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Walden University
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Abstract

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by

William Sanchez

MS, Kaplan University, 2014

BS, University of Phoenix, 2010

Proposal Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

Individuals with intellectual developmental disabilities occasionally exhibit challenging behaviors through forms of aggression. Interventions, such as cognitive behavioral therapy, and applied behavioral analysis, have all been shown to be effective in reducing symptoms of aggression. This quantitative study used a secondary analysis of clinical records from an agency that provides day treatment services for adults with intellectual disabilities. To assess the effectiveness of a mindfulness-based stress reduction (MBSR) program in reducing aggression in this population, 18 individuals with various levels of intellectual disabilities participated in an 8-week MBSR while an additional 18 participants served as the wait list control group and received the same intervention soon after the study was completed. The study examined whether a mindfulness-based intervention can reduce aggression based on the Modified Overt Aggression Scale (MOAS) and also increase participants' awareness of meditation based on the Child Adolescent Mindfulness Measure (CAMM). A 2x2 ANOVA was used to determine differences between measures, pretest and posttest. Results indicated no differences in aggression before and after the administration of the mindfulness-based intervention for either the experimental or control group. However, CAMM scores indicated that participants came to understand the concept of mindfulness, even though this did not yield measurable changes in their behavioral outcomes. This study will inform clinicians about mindfulness in programs for adults with disabilities and research indicates that MBSR is a program which is beneficial for adults with developmental disabilities and may serve as an additional coping mechanism in dealing with aggression.

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Dedication

There are no words that can describe the way I feel about this accomplishment. This doctoral study is dedicated to the people in my life who have shown me the support and guidance, encouragement, and love that is needed to achieve such an accomplishment. I have been blessed with a great family and great friends (Anthony, David and Regina) and I thank each and every one who has stood by my side.

To my amazing mother, I thank you from the bottom of my heart for instilling the passion and motivation, the desire to achieve more, and the drive that was needed to complete this study. You have taught me to never give up, try and succeed to the best of my abilities, and for this I thank you. To my father, although you are not here, I dedicate this to you as well. I know you are looking down with a smile and saying "my son Dr. Sanchez has made it."

Martin, Christopher S., Valery, Cesar, Christopher Q., and Alyza, my siblings. Although, we sometimes might not meet eye to eye, you all have been my guide and my rock, and I am proud to be called your brother. The one and only Alex, whom I adore and love dearly, I thank you for dealing with my early mornings on the computer to finish this dissertation. Thank you for standing by my side (Love you!).

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Chapter 1: Introduction to the Study

One of the significant barriers in treating adults with intellectual disabilities is the challenging behaviors they exhibit on a regular basis, such as physical aggression, verbal aggression, and self-injurious behavior (Allen, 2000; Brosnan & Healy, 2011). According to Allen (2000), the prevalence rate for aggressive behavior in this client group appears to vary between 2- 20% depending on the sampling procedures adopted and increases depending on the severity of the disability. Identifying an accurate prevalence rate for aggression is difficult because of the various operational definitions that are used; therefore, differences in terminology can affect the prevalence rate of aggressive behavior (Allen, 2000).

Treatment methods such as cognitive behavioral therapy (CBT) and mindfulness have proven to be successful in decreasing aggression (Fix & Fix, 2013) as they encourage individuals to focus their attention to the present moment and help the them in learning to self-manage and regulate their own behavior (Singh et al., 2011a). According to Parent, Birtwell, Lambright, and DuBard (2016), teaching coping skills to individuals with developmental disabilities can help in dealing with everyday stressors and behaviorally-based strategies, such as breathing techniques, which have been shown to be effective.

In this chapter, I present an overview of the background of this study and highlight: the problem statement, purpose of the study, significance, research questions, conceptual framework, definition of terms, assumptions, limitations and deliminations, and the significance of the study, and then conclude with a chapter summary.

Background

The following section provides a brief overview of the use of MBSR to improve mental health, and in particular to reduce behaviors associated with aggression, in adults with intellectual disability. An abbreviated discussion of aggression, MBSR and ID are provided. A comprehensive overview and description of the benefits of MBSR as a strategy to reduce aggression in adults with ID is subsequently presented in Chapter 2.

One of the significant barriers in treating adults with intellectual disabilities is the challenging behaviors they exhibit on a regular basis, such as physical aggression, verbal aggression, and self-injurious behavior (Allen, 2000; Brosnan & Healy, 2011). According to Allen (2000), the prevalence rate for aggressive behavior in this client group appears to vary between 2- 20% depending on the sampling procedures adopted and increases depending on the severity of the disability. Identifying an accurate prevalence rate for aggression is difficult because of the various operational definitions that are used; therefore, differences in terminology can affect the prevalence rate of aggressive behavior (Allen, 2000).

A characteristic of physical aggression is attempting to or successfully injuring another person (Matson & Kozlowski, 2012). Physical aggression is considered one of the most perplexing and stressful forms of challenging behavior shown by those diagnosed with intellectual disabilities (Allen, 2000).

Lopata, Nida, and Marable (2006) indicated that there are physiological changes, such as increased heart rate and increased respiration that occur during arousal when an individual is experiencing increased levels of stress and anxiety. These physiological

changes are manifested in the form of elevated heart rate, increased respiration, elevated blood pressure, increased cortisol levels, and muscle tension. They then lead to behavioral dysregulation, in the form of aggression (Lopata et al., 2006).

There are several strategies, such as the development of a person-centered behavioral support plan that are used in the treatment of aggression, specifically those that are based on the principles and procedures from applied behavior analysis (ABA) and positive behavioral supports. Allen (2000) stated that the use of ABA and teaching coping strategies are several ways in helping individuals deal with both internal and external factors associated with aggression. Interventions to help reduce stress, maintain well-being, and reduce challenging behavior are needed and benefits as an additional coping strategy (Benn, Akiva, Arel, & Roser, 2012).

Treatment methods such as cognitive behavioral therapy (CBT) and mindfulness have proven to be successful in decreasing aggression (Fix & Fix, 2013) as they encourage individuals to focus their attention to the present moment and help the them in learning to self-manage and regulate their own behavior (Singh et al., 2011a). According to Parent, Birtwell, Lambright, and DuBard (2016), teaching coping skills to individuals with developmental disabilities can help in dealing with everyday stressors and behaviorally-based strategies, such as breathing techniques, which have been shown to be effective. Manicavasagar, Perich, & Parker (2012) state that CBT can teach positive thinking to an individual with developmental disabilities when addressing negative thinking patterns, dysfunctional attitudes, and negative automatic thoughts that can lead to aggression.

Brown and Ryan (2003) stated that mindfulness can help individuals with developmental disabilities manage automatic thoughts, habits, and unhealthy behavior by bringing the individual to the present moment. The practice of mindfulness and relaxation has proven effective in reducing symptoms of anxiety, depression, anger, and stress (Robertson, 2011). Singh et al. (2006) stated that mindfulness allows an individual to consider alternative ways of coping with certain situations. Brown and Ryan (2003) stated that mindfulness is an attribute of consciousness long believed by practitioners to promote well-being.

Mindfulness serves as an approach that may decrease aggression as it provides cognitive skills for managing aggressive behavior (Fix & Fix, 2013). It can be used as an intervention that can be modified to fit the individual's needs, based on cognitive skills (Hart & Robbins, 2014). Singh et al. (2006) indicates that mindfulness training produces significant changes in behavior in those diagnosed with intellectual disabilities. According to Hwang and Kearney (2013), effectively teaching mindfulness to those diagnosed with mild intellectual disabilities and autism has enhanced self-control, and thereby prevented the occurrence of physically aggressive behavior in various settings, ultimately increasing the quality of life for these individual with developmental disabilities.

Those with intellectual disabilities and autism can be taught to reduce physical aggression by employing specific behavioral strategies including mindfulness-based stress reduction (MBSR) (Fix & Fix, 2013). Meditation, mindfulness, guided imagery, and progressive relaxation may ultimately have a positive impact on behavior in those

with intellectual disabilities (Brosnan & Healy, 2011) and teach specific appropriate ways of responding to aggression, such as mindfulness breathing, and meditation (Singh, Wahler, Adkins, & Meyers, 2003).

Problem Statement

The current study addresses the gap in the literature regarding the impact of teaching a MBSR procedure on frequency and intensity of aggression in adults with intellectual disabilities. Although prior research (Adkins et al., 2010; Singh et al., 2003; Singh et al., 2010; Singh et al., 2011a; Sturmey, 2004; Taylor, 2002) indicated effective results in reducing anxiety, the research does not significantly address aggression as a target response. Previous research has focused on the use of meditation and mindfulness; however, there is limited research on the use of progressive relaxation that includes muscle relaxation and guided imagery.

The results of the current research may help to inform best practices for mental health practitioners working with individuals with intellectual disabilities by identifying coping skills necessary to reduce aggression and maintain emotional stability. Once emotional stability is achieved, this may lead to an improved quality of life for individuals with developmental disabilities.

Purpose

The purpose of this study was to determine if MBSR, which includes progressive muscle relaxation, guided imagery, and light yoga (asana), will reduce physical aggression in adults diagnosed with intellectual disabilities.

Significance

This research will fill a gap in the literature in understanding the effect of MBSR to reduce aggression in adults with intellectual disabilities. There is a societal need to ensure that those diagnosed with intellectual disabilities become productive members of society and not stigmatized because of their lack of ability to maintain behavioral control. The study will help future researchers identify the effects of MBSR and aggression. The study will potentially have significant social change implications for intellectually disabled adults as it will help increase their quality of life by teaching individuals with intellectual disabilities appropriate coping mechanisms to reduce aggression. This may allow them to be integrated as productive members of society.

Framework

The theoretical basis for this study was derived from Kabat-Zinn's MBSR theory. The basic concept of MBSR is to concentrate on the present moment, distracting one from current concerns, stresses, or worries and having the ability to relax one's mind by means of combining progressive muscle relaxation, meditation, and mindfulness all in one program.

MBSR is an intensive training program that was initially developed for chronic pain management. MBSR consists of meditation practices and mindfulness training, taught in a variety of contexts, including while walking, sitting, standing, or eating (Hoppes, Bryce, Hellman, & Finlay, 2012). Studies conducted on mindfulness by Kabat-Zinn's MBSR program have proven to be effective in the reduction of anxiety and depression.

Adkins et al. (2010) stated that aggression in adults with intellectual disabilities can be controlled and maintained in many ways including psychotropic medication and behavior analytic intervention. Other forms of interventions, such as CBT, may not be suitable for all people with intellectual disabilities (Idusohan-Moizer, Sawicka, Dendle, & Albany, 2015) due to the reduced cognitive ability to understand the techniques and the high need of support required (Idusohan-Moizer et al., 2015). However, the implementation of mindfulness techniques, such as deep breathing and visualizations with those diagnosed with intellectual disabilities is promising in providing an additional coping mechanism (Idusohan-Moizer et al., 2015).

The implementation of a MBSR program on the intellectual disability population has proven to be effective in reducing symptoms such as stress, anxiety, and depression (Goldin & Gross, 2010). Mindfulness has been shown to be an effective treatment in reducing psychological symptoms and an overall calming experience where the person is able to focus their attention on a specific task and calm themselves (Adkins et al., 2010). Although mindfulness has proven to be effective in relaxation and calming procedures, there is not enough evidence that shows it as an effective intervention specifically in reducing physical aggression in those diagnosed with intellectual disabilities.

Research Questions

RQ1: What is the effect of training adults with mild intellectual disabilities in MBSR techniques on aggression (severity and intensity of physical aggression, verbal aggression, aggression against property, and autoaggression) as measured by the Modified Overt Aggression Scale (MOAS)?

$H_0$1: Adults with mild intellectual disabilities who received training in MBSR techniques will show a decrease in aggression (severity and intensity of physical aggression, verbal aggression, aggression against property, and autoaggression) relative to those who did not receive training in MBSR techniques.

H_a1: Adults with mild intellectual disabilities who received training in MBSR techniques will not show a decrease in aggression (severity and intensity of physical aggression, verbal aggression, aggression against property, and autoaggression) relative to those who did not receive training in MBSR techniques.

RQ2: What is the effect of time of assessment (preintervention with MBSR techniques and postintervention with MBSR techniques) on aggression (severity and intensity of physical aggression, verbal aggression, aggression against property, and autoaggression) in adults with mild intellectual disabilities?

$H_0$2: There will be a reduction in aggression (severity and intensity of physical aggression, verbal aggression, aggression against property, and autoaggression) in adults with mild intellectual disabilities at the posttest assessment relative to the pretest assessment.

H_a2: There will not be a reduction in aggression (severity and intensity of physical aggression, verbal aggression, aggression against property, and autoaggression) in adults with mild intellectual disabilities at the posttest assessment relative to the pretest assessment.

RQ3: What is the effect of training adults with mild intellectual disabilities in MBSR techniques on mindfulness as measured by the Child and Adolescent Mindfulness Measure (CAMM)?

$H_0$3: There will be an increase in mindfulness as measured by the CAMM on adults with intellectual disabilities.

H_a3: There will not an increase in mindfulness as measured by the CAMM on adults with intellectual disabilities.

RQ4: What is the effect of time of assessment (preintervention with MBSR techniques and postintervention with MBSR techniques) on mindfulness in adults with mild intellectual disabilities?

$H_0$4: There will be an increase in mindfulness (preintervention with MBSR techniques and postintervention with MBSR techniques) in adults with intellectual disabilities.

H_a4: There will not be an increase in mindfulness (preintervention with MBSR techniques and postintervention with MBSR techniques) in adults with intellectual disabilities.

Nature of the Study

This study used secondary analysis of clinical records from an agency that provides day treatment services for adults with a wide range of intellectual disabilities. The agency conducted an MBSR intervention with adults who had been diagnosed with mild intellectual disabilities. The participants were in two classrooms of 18 individuals and the Director of Psychological Services at the day program facility and a masters level

Behavior Intervention Specialist conducted the MBSR program. The intervention lasted for 30 minutes, three times a week for 8 weeks.

The intervention consisted of light yoga poses, guided meditation, progressive muscle relaxation, meditation or ambient music, and mindfulness breathing. The intervention was initiated with two classes (a total of 36 participants). One class of 18 participants received MBSR training; the second class of 18 participants was a waitlist control group, and received MBSR training after the completion of data collection. Members in the waitlist control group were comparable to the treatment group in terms of all intellectual and demographic characteristics. Participant selection within the facility was based on the individual and their guardian's interest in their participation in MBSR training and their cognitive ability to understand the concept of mindfulness and its intervention procedures. Participant assignment was based on a convenience sample and not randomly assigned. The intervention was offered as a component of the facility's therapeutic services, as an addition to previously existing wellness programming. The research study was a secondary analysis of clinical records to assess the effectiveness of this therapeutic approach.

The facility used the Modified Overt Aggression Scale (MOAS) a quantitative measure of various types of aggression–verbal, physical, aggression against property, and autoagression--as a standard clinical procedure for assessing aggression in facility participants (see Appendix A). The scale is designed to measure the occurrence of each type of aggression on a 0-4 weighted scale. The ratings of 0-4 refer to the severity of the behavior occurring, and specific examples are listed for each rating. Therefore, more

than one item can be checked in each category if that behavior occurred. The total score for each subscale is the weighted sum. Therefore, an individual who demonstrated verbal aggression at all levels might have received a check mark next to the items 1, 2, 3, and 4 which would have resulted in a score of 10 for verbal aggression.

The scale is a measure of the occurrence and severity of aggressive behavior, but not a measure of frequency. Therefore, if an adult is rated a 1 on the occurrence of verbal aggression, which means the person "shouts angrily, curses mildly, or makes personal insults," there would be no way to know if the person significantly reduced the frequency of that behavior over time using this scale. The agency modified the scale to include a frequency measure as well for each type of aggression. The total sum of all ratings for each type of aggression was used for analysis as they determined the severity and frequency of the various types of aggression the individual engaged in prior to and after the intervention. The MOAS weekly scores for the 3 weeks prior to the implementation of treatment and the 3 weeks after completion of the 8-week mindfulness program was used as pretest and posttest measures to determine the impact of the mindfulness intervention on aggression.

The second instrucment was the Child and Adolescent Mindfulness measure. As seen in appendix E the Child and Adolescent Mindfulness Measure (CAMM) developed by Greco, Baer, and Smith is a ten question likert-type scale used to assess the individual's awareness and the effectiveness of a mindfulness program (Greco, Baer, & Smith, 2011).

Based on the manner the intervention was implemented, it allowed for a pretest-posttest with a waitlist control group experimental design to be used. According to Barger-Anderson, Domaracki, Kearney-Vakulick, and Kubina (2004), the multiple baseline across participants design addresses the impact of the treatment on the same behavior, for different participant. There were two groups: those that received the intervention and those that did not receive the intervention, and eight dependent variables, each subscale of aggression identifying the severity and frequency of the aggression quantitatively measured by the MOAS, which included physical aggression, verbal aggression, aggression against property, and autoagression.

Consent to participate in the mindfulness intervention was obtained by primary caregivers; consent forms are maintained in the agency's records department. All participant information was deidentified prior to the research study. Collection of secondary data began once Walden University's Institutional Review Board (IRB) 06-15-18-0572899 reviewed the application and approved analysis of data.

Definition of Terms

Applied Behavior Analysis (ABA): Derived from the basic research of experimental analysis of behavior, ABA is an analytic and systematic approach to manipulate the environment to help individuals decrease specific response of behavior (Cooper, 1982).

Cognitive Behavioral Therapy (CBT): A form of psychological treatment that is based on principles of changing behavioral patterns of thinking, providing coping

mechanisms and strategies that include calming one's mind and relaxing one's body (American Psychological Association, 2017).

Intellectual Disability: A term to describe an individual who is impaired in multiple life skill areas such as cognitive functioning, social skills, and adaptive behavior. Lower IQ levels typically do not allow for the ability to adapt to daily living skills without assistance or support (World Health Organization, 2017)

Mindfulness: Being present or paying attention to the present moment, which allows for an open experience (Heppner et al., 2008).

Mindfulness-Based Stress Reduction (MBSR): An 8-week mindfulness program designed by Jon Kabat-Zinn to assist those with relieving symptoms of stress and pain (Kabat-Zinn, 2011).

Modified Overt Aggression Scale (MOAS): A rating scale that is used to measure levels of aggression in adults with intellectual disabilities (Oliver, Crawford, Rao, Reece, & Tyrer, 2007)

Assumptions

Several assumptions were made in this mindfulness program. I assumed that the MBSR program would be effective in reducing aggression in adults with intellectual disabilities. I also assumed that it taught the participants an additional coping mechanism when dealing with stress, or anger.

Limitations

There were several limitations noted in the mindfulness program. Psychotropic medication may have played an important influence as an extraneous variable as

psychotric medication can interact with the participants behavior. Participants were told not to adjust their medication regimen during the MBSR program; therefore, medication might have influenced the reduction in aggression levels. The sample in the study included participants that were on both psychotropic medication and those that were not on psychotropic medication. Psychotropic medication was not a control in this study.

Another limitation to the mindfulness program was that although both the Director of Psychological Services and the masters level psychologist were both trained in behavior management, neither were formally trained in providing meditation as a certified meditation instructor, although thye completed online coursework in MBSR; therefore, the instructors minimal experience in teaching MBSR may have reduced programmatic outcomes. Another limitation was that MBSR training is most effective when done consistently and at longer periods in both dose and duration, compared to the 30-minute sessions over eight-weeks that was provided in this mindfulness program, which may have reduced the potential for programmatic impact. Time and dedication was another important factor when learning meditative practices.

Delimitations

Delimitations of this mindfulness program included the population that was studied and the location of the intervention. This mindfulness program was restricted to adults with mild intellectual disabilities. The study was conducted at a day program facility. Future research including participants diagnosed with other cognitive levels of functioning and residential facilities may allow for broader generalization of results.

Possible Types and Sources of Data

The primary data source was secondary behavioral data information, in the form of the MOAS, obtained from the facility. This behavioral data was analyzed to determine the frequency and intensity of aggression on a weekly basis prior to and after the MBSR intervention. The data were used to determine the efficacy of the intervention in reducing aggression.

Summary and Transition

This chapter introduced the problem statement, the purpose of the study and its significance. It provided the research questions along with hypotheses, the nature of the mindfulness program, and the theoretical framework that aligns with the research. Also discussed were assumptions and limitations that were possible threats to internal validity.

Chapter 2 will introduce the literature review in the areas of intellectual disability, aggression, MBSR and its components, and the gap in the literature. Chapter 3 includes a detailed description of the research method and its procedures used for the study, its design, setting, population, sample, and the measurement tool used to determine the level of aggression exhibited with the participants.

Chapter 2: Literature Review

Introduction

In this study, I examined the effects of a MBSR program on a group of adults diagnosed with intellectual disabilities. A MBSR program can provide a reduction in aggression and increase the use of skills for coping strategies with behavior and anxiety (Lopata et al., 2006).

An extensive review of the literature was performed searching Walden University Library databases, periodicals, peer-reviewed journal articles, textbooks, and professional reference books. Some of Walden University's online databases that include ProQuest Dissertations, Google Scholar, PsycINFO, Thoreau, PsycTHERAPY and EBSCOHost were used to gather a copious amount of information. Search terms include: *intellectual disability, physical aggression, anxiety, mindfulness-based stress reduction (MBSR), yoga, deep breathing, progressive muscle relaxation,* and *the brain and mindfulness-based stress reduction.*

The current study was to determine the effects of MBSR in reducing physical aggression in adults with intellectual disabilities. Several key terms were used to narrow down the search on mindfulness and the target population: *intellectual disability, developmental disabilities, special needs, autism, MBSR, mindfulness-based stress reduction, meditation, mindfulness, mindfulness meditation, physical aggression, aggression, challenging behavior,* and *maladaptive behavior*. These terms were all beneficial in producing a vast amount of literature that pertains to the topic.

MBSR intervention programs have gained international interest. The effects of mindfulness have had drastic effects in reducing symptom physiological symptoms of aggression on those diagnosed with intellectual disabilities and autism. Idusohan-Moizer et al. (2015) stated those diagnosed with disabilities have higher risks of lifetime social stigma and discrimination, and mindfulness can help these individuals overcome these risks by increasing their coping skills and resilience.

MBSR Theory

Mindfulness is a systematic approach to developing moment to moment awareness (Bazzano et al., 2015). Those diagnosed with intellectual disabilities are usually prone to higher levels of anxiety, depression, and challenging behaviors (Emerson et al., 2001; Hartley & MacLean, 2009; Matson et al., 2008; Reid et al., 2011). According to Hastings and Manikam (2013), there little empirical evidence that explores the use of mindfulness interventions for individuals with diagnosed with intellectual disabilities.

MBSR is an 8-week program that is derived from Kabat-Zinn at the University of Massachusetts Medical Center in 1979. Principles of MBSR convey Buddhist meditative traditions and the systematic training and refinement of one's attention and awareness to the present moment (Center for Mindfulness in Medicine, 2014). Historically, MBSR originated from Buddhist traditions in that its views on human nature and formal medicine for treating diseases have profound insight in terms of using awareness, the mind, and the heart to bring one back to the present moment. According to Kabat-Zinn

(2003), meditative practices assist in alleviating human suffering, it is used to calm the mind, open the heart, and refine attention and action.

Kabat-Zinn established MBSR as a vehicle to effectively train patients to use mindfulness in the immediate application of stress. Kabat-Zinn felt the MBSR intervention should be free of cultural and religious factors but learn the approach of calming one's mind and the systematic approach of body scanning and deep breathing. The purpose of the intervention was to make a connection between the mind and the body that will relieve some suffering associated with some medical disorders such as high blood pressure, worries, anxiety, and or pain (Kabat-Zinn, 2003).

Kabat-Zinn established the Stress Reduction Clinic, where patients are taught mindfulness practices using the newly designed MBSR approach. He initially established the clinic for those suffering from chronic pain and were not responding to traditional treatment. Mindfulness was also used on other populations in both clinical and nonclinical applications, such as with parents and caregivers of individuals with developmental disabilities, individuals with anxiety disorder, urban youth with human immunodeficiency virus (HIV), and those who used mindfulness to quit smoking.

These studies all report positive outcome, such as reduction of pain, and anxiety after the implementation of the MBSR program. The implementation of a MBSR program developed by Kabat-Zinn has become popular in various disciplines of mental health and general medicine practice as it has become an alternative approach to treatment for stress, psychiatric concerns, pain, and even substance abuse disorders.

Singh et al. (2003) stated that mindfulness allows an individual to be aware of external and internal conditions, specifically those associated with physiological arousal state of aggression. Mindfulness-based interventions have been successful in changing behaviors of those suffering from various clinical disorders (Wilson & Dixon, 2010). It is used as an alternative treatment that may decrease aggression and increase resilience.

Singh et al. (2011b) conducted a case-study using MBSR as a tool to help an adult with an intellectual disability to stop smoking cigarettes. Singh et al. (2011b) used *Meditation on the Sole of the Feet,* a meditative script for individuals diagnosed with intellectual disabilities as a guided tool that works in conjunction with deep breathing, self-affirmation, and diverting his attention to the soles of his feet when he has the urge to smoke. The meditative script approach was beneficial in decreasing the participants intake of smoking during the 82 days of intervention and was effective as a long-term approach as he did not smoke during the three-year follow-up.

MBSR is also used for the reduction of aggression, depression, and anxiety in individuals with intellectual disabilities. One strategy is a mindfulness MBSR program to reduce aggression in those with intellectual disabilities as a tool to help in diverting their physical aggression and anger towards a neutral part of their body, such as the soles of their feet. According to Fix and Fix (2013), mindfulness helps in self-regulating the participants attention and helps in increasing nonjudgmental acceptance of their experiences.

Heppner et al. (2008) found that theories such as the heighten-ego-involvement theory suggest that mindfulness may be linked to lower levels of hostility and aggressive

behavior (p. 486). Two studies were conducted with adults (both men and women) to examine the use of mindfulness in reducing aggression; as a result, both studies found a correlation with a higher disposition of meditation (p489) and a lower reported rate of hostility and aggression.

Singh, Wahler, Adkins, and Myers (2003) investigated if a newly developed mindfulness-based self-control intervention would benefit in reducing aggression in adults with mild intellectual disability and mental illness. Singh developed a modified version of the MBSR called the *Soles of the Feet* as seen in Appendix C which is designed to divert the attention from a heightened state to a neutral part of the individual's body, such as the soles of their feet (Singh et al., 2003). During baseline, the participants were reported to have high levels of aggression, which include both physical and verbal aggression. After implementation of the mindfulness procedure, Singh et al. report a gradual tapering of medication and a significant reduction in aggression.

Mindfulness-based procedures are also beneficial for those that are diagnosed with autism spectrum disorder. Spek, van Ham, and Nyklicek (2013) examined the use of a modified Mindfulness-Based Therapy (MBT-AS) procedure on individuals with high functioning autism. Forty-two participants were randomly chosen for a nine-week training session of the MBT-AS, while others were part of the control group (Spek et al., 2013). The procedure consisted of mindfulness eating, body scan, sitting meditation, deep breathing, and yoga exercise. Results indicate no significant difference in the variables with the study regarding gender, age and diagnoses and a significant reduction

in depressive symptoms, symptoms of anxiety, and rumination with an increased positive effect compared to the control group (Spek et al., 2013 p 250).

The mindfulness-based stress reduction model can be considered a new treatment approach to the field of intellectual disabilities in that it can be used as a management procedure (Singh, et al., 2007a) that can be used to reduce anxiety, and anger, but also control the topography of behaviors, such as self-injuries behavior and physical aggression. Majority of interventions used in the field has geared towards the use of CBT application, however Spek, et al., (2013) indicates that the use of CBT although positive generally takes a long time for individuals to grasp the concept of its application.

Intellectual Disability

According to the American Psychiatric Association (2013), intellectual disability has an overall general population prevalence rate of 1%, which varies by age. According to The Center for Disease Control and Prevention (2015) research has found that estimates of the prevalence of children with intellectual disability that includes, cerebral palsy, hearing loss, and vision impairment has remained the same over the past 15-20 years, however there has been an increase in the prevalence of children with autism.

The term intellectual disabilities, although a relatively new terminology (APA, 2013) has a long history. Mongolism, retard, mentally retarded and feeble-minded was just a few terminologies used to describe those that were “different” or handicapped (President’s Committee on Mental Retardation, 1976). Reiss (2000) defined mental retardation as:

> A substantial limitation in the present functioning. It is characterized by significantly sub-average intellectual functioning, existing concurrently with related limitations in two or more adaptive skill areas: communication, self-care, home living, social skills, community use, self-direction, health and safety, functional academics, leisure, and work. Mental retardation manifests before 18. (p. 70)

The APA (2013) defined intellectual disability with characteristics by deficits in mental abilities, and deficits in impairment of adaptive functioning. The onset of intellectual disability usually occurs during the developmental period (APA, 2013), however, intellectual disability can be diagnosed until the age of 18; this can happen anytime during the age range of 0-18 years, which will fall under that category of mild, moderate, severe or profound (American Association on Intellectual Developmental Disability, 2017). The disability terminology long ago had several meanings and definitions; Brown and Radford (2007 p 17), states that anyone with a variety of limitations including anemia, blindness, head injuries, learning disabilities and mobility impairments were classified as disabled and treated differently by society.

Many contributing factors may lead to a diagnosis of intellectual disability. A diagnosis may be associated with a genetic and chromosomal deviations, such as Down syndrome (APA, 2013), head trauma that occurs before the age of 18, and environmental influences (APA, 2013), such as substance exposure, and maternal disorders (Beirne-Smith, Ittenbach, & Patton, 2001). According to Beirne-Smith et al. progress has been

made to prevent a diagnosis of intellectual disability by using proactive measures such as identifying risk factors, and early prenatal care (Beirne-Smith et al., 2001).

Individuals diagnosed with an intellectual disability are classified by four categories, which include mild intellectual disability, moderate intellectual disability, profound intellectual disability, and severe intellectual disability (Beirne-Smith et al., 2001). Those that are diagnosed with mild intellectual disability function at a higher level than an individual diagnosed with moderate intellectual disability (Beirne-Smith et al., 2001).

According to the DSM-5 (APA, 2013) the Intelligence Quotient (IQ) was a measurement used to determine the cognitive level of functioning and its severity, however the new DSM guidelines indicates that adaptive functioning is based on level of support required and not the IQ score (APA, 2013).

Those that fall within the mild to moderate range of intellectual disability demonstrate adaptive behaviors or skills at the higher end of the continuum (Beirne-Smith et al., 2001) compared to those that are diagnosed within the profound to severe range of intellectual disability. According to Katz and Lazcano-Ponce (2008) individuals with mild intellectual disability can develop communicative and social skills and can cognitively function at a higher level compared to their counterparts.

Persons with various intellectual disabilities engage in different topographies of aggression. Table 1 shows the relationship between several syndromes and their behavioral, emotional or mental disorders. This information is relevant in identifying the overall general appearance of aggression with various disabilities.

Table 1

Topography of Aggression within the Facets of Intellectual Disability

Diagnosis	**Variables to Behavioral Challenges**
Down Syndrome	Externalize behaviors, usually ADHD and task avoidance
Fragile X Syndrome	Individuals with Fragile X Syndrome are usually diagnosed with ADHD, Over stimulation can lead to aggression, females are prone to increased anxiety levels and social avoidance
Prader-Willi Syndrome	Individuals with Prader-Will Syndrome are prone to increased behavioral outburst, anxiety and other self-injurious behaviors
Klinefelter Syndrome	Usually isolated and withdrawn, may develop impulse control disorders and assertive behaviors
Williams Syndrome	Usually develop an increase of attention disorders, anxiety, eating disorders, and sleeping problems
Tuberous Sclerosis	Hyperactive, 50% are usually diagnosed with autism and sleep disturbances
Angelman's Syndrome	Poor attention spans, and unexplained laughing episodes

Source. From Florida Developmental Disabilities Council (2009).

Those that fall into the severe to profound range of intellectual disability require more supportive services and supervision (APA, 2013) because the disability is more pronounced than that of individuals with mild intellectual disability. Katz and Lazcano-Ponce (2008) indicates these individuals have more significant delays with minimal functional ability regarding basic care and therefore require higher levels of supervision.

Social skills and communication are a major concern for those diagnosed with intellectual disabilities. According to Matson, Dempsey and Rivet (2009) individuals with intellectual disabilities, autism, and related disorders are at higher risk of difficult

behaviors and comorbid psychopathologies, such as depression and rumination. Matson, Fodstad and Rivet (2008) studied the relationship between socials deficits and challenging behaviors with 257 adults diagnosed with severe intellectual disability and autism spectrum disorder. Results indicated the presence of negative behaviors that were more predictive of stereotypy, property destruction, and aggression (Matson et al., 2009).

The lack of communication, social skills, and inability to express their wants and needs are predictors of challenging behaviors in adults with intellectual disabilities (Hutchinson & Prelock, 2014). Functional Behavioral Assessment (FBA) is one approach that many clinicians use to determine the function of behavior (Beirne-Smith, Ittenbach & Patton, 2001; Brosnan & Healy, 2011; Hayward, Gale & Eikeseth, 2009 Matson & Kozlowski, 2012). The function of a behavior is categorized into four classifications, which include attention-based behaviors, sensory-based behaviors, escape-based behaviors, and tangible-based behaviors (Matson et al., 2011). Although effective in determining the function of the behavior, one must be able to develop proper intervention strategies that can address the function of the behavior (Scott, McIntyre, et al., (2005).

The use of Applied Behavior Analysis (ABA) along with an FBA can be used to address behavioral deficits such as communication, play skills, and social skills (Hayward, et al., 2009 p 575). This intervention is an evidence-based intervention using B.F. Skinner's theory of operant learning and verbal behavior (Frost & Bondy, 2009). However, interventions, such as ABA can be labor intensive, time-consuming, and require extensive staff training for effective implementation (Wilson & Dixon, 2010).

Other evidence-based interventions and environmental modification procedures using the principles of applied behavior analysis, such as the token economy system, manipulation of reinforcements, and extinction (Brosnan & Healy, 2011) have also been effective in reducing challenging behavior. These interventions do not target the biological, socio-emotional, and cognitive aspect of behavior (Parent, et al., 2016). Cognitive behavioral interventions, such as psychotherapy, which includes mindfulness and relaxation techniques, have all been successful in helping individuals with intellectual disabilities and autism in dealing with everyday stressors, and improving coping abilities (Parent et al., 2016).

State regulations and policies now implement the use of a person-centered approach to promoting positive behavioral change. According to the *New York State Office of People with Developmental Disabilities (OPWDD)*, Person-Centered Behavioral Intervention 14, NYCRR Part 633.16 person-centered planning now involves the individual to make informed choices in his or her planning, services and supports he or she might be receiving. Components can include the use of behavioral interventions and psychotropic medication. This approach follows the guidelines that promote the beliefs that people with intellectual disabilities are people first (NYS Office for People with Developmental Disabilities, 2015).

Aggression

Over the last thirty years, a large body of literature has discussed the prevalence, concern, and impact of challenging behavior shown by those diagnosed with intellectual disabilities (McClintock, Hall, & Oliver, 2003). Physical aggression can be a common

problem for those diagnosed with intellectual disabilities (Singh, Lancioni, Karazsia, & Myers, 2016). Those diagnosed with certain syndromes such as Prader-Willi, Angelman's, and Fragile X are at higher risk of engaging in aggressive behavior (Singh et al., 2016). Other forms of aggression such as self-injurious behavior (SIB) can pose a grave risk to the person with an intellectual disability (Matson, Cooper, Malone, & Moskow, 2008) as it results in trauma and medical concerns (Matson et al., 2008).

Aggressive behavior in any form can last for a few seconds or be shown in random bouts of episodes that may last for hours (Matson et al., 2008). A study conducted by Matson et al. concluded that individuals diagnosed with intellectual disabilities are more likely to engage in challenging behavior that includes physical aggression, SIB, property destruction, and sexually inappropriate behavior compared to the control group.

Other factors that contribute to the prevalence of physical aggression disorders include bipolar, depression, anxiety, and obsessive-compulsive disorders (OCD) (Matson et al., 2008). Individuals with intellectual disabilities that engage in physical aggression display negative social skills, and undesirable social behaviors (Matson et al., 2008) that place them at a higher risk of isolation and institutionalization. Isolation and institutionalization have serious consequences for the individual's quality of life across their development (Brosnan & Healy, 2011) specifically those seeking residential placement, family care/community residence or independent living. According to Farmer and Aman (2011), the research literature indicates that aggressive behavior often has a negative impact on individual's lives. The consequences associated with engaging in

physical aggression can cause more restrictive environment and use intrusive procedures (Brosnan & Healy, 2011) that include psychotropic medication and intensive behavioral interventions.

There are several ways that aggression in individuals with intellectual disabilities is controlled, managed or treated (Adkins, Singh, Winton, McKeegan, & Singh, 2010). One way is through psychopharmacological and behavior modification (Adkins et al., 2010); however, the use of psychopharmacological intervention has proven to have little evidence to support the use of its effectiveness in behavior management (Adkins et al., 2010). Matson and Neal (2009) indicate that psychotropic medication to effectively treat challenging behavior in those with intellectual disabilities has shown little progress. However, there has not been subsequent research to indicate the effectiveness of psychotropic medication within the intellectual disability population. The lack of controlled studies in determining the efficacy of psychotropic medication has also made it difficult to determine its effectiveness.

A study conducted by Horner, et al., (2002) shows that early intervention can reduce challenging behavior by 80-90%. However, it does not explicitly indicate the treatment approach method and its use. Contributing factors such as manipulation of the environment resulted in the 80% reduction of problem behavior in comparison to the nine studies that were analyzed in Horner's study. Using psychotropic medication such as Respirdal, Abilify, Ativan, Haldol, and many others are used to treat the underlying causes of aggression in adults with intellectual disability (Brosnan & Healy, 2011) such as medical conditions, psychosis, and other significant mental health concerns.

Reoccurring physical aggression can be accounted for by having a direct relationship with a psychiatric condition, such as mood disorders, social conditions, and psychological conditions (Gardner, Griffiths, & Hamelin, 2012 p 84).

Using psychotropic medication to control physical aggression has serious effects on those diagnosed with intellectual disability. Brosnan and Healy (2011) state that many of the psychotropic drugs have a drastic impact on learning and social opportunities and can be intrusive as a chemical restraint. This approach has serious clinical implications, and the efficacy of the use of medication has shown to be inconclusive (Brosnan & Healy, 2011).

Several variables are present while an individual with intellectual disabilities is engaged in physical aggression. Gardner et al., (2012) indicated that antecedent stimulus that includes arousal, which includes external and internal factors are all present during a crisis. Psychological aspects, precursors of aggression and antecedents significantly increase or decrease aggressive responding (Gardner et al., 2012).

Allen (2000) states that there are four etiological types of aggressive behavior. These are (1) instrumental aggression; which is associated with an intent to achieve the goal intended; (2) irritable aggression which is caused by frustration; (3) sexual aggression which is related to sexual arousal; and (4) fear-induced aggression, which is caused by anxiety and the fight-flight response (p 43). Several conditions can be noted for those that engage in physical aggression, for example, Allen states that setting or environmental events can all be triggers that can maintain and induce aggressive behavior.

Another approach to the use of behavior management is the use of Applied Behavior Analysis. This practical approach focuses on the environmental factors that contribute to increase aggression (Parent et al., 2016), such as triggers and antecedents. Applied behavior analysis and its evidence-based interventions are used to decrease aggression via extinction, positive punishment, or negative punishment (Allen, 2000). These interventions have proven to be effective in reducing the challenging behavior. However, the modifications of external factors are being addressed, whereas the internal precipitants are not being accounted for as with the use of cognitive therapy, which includes mindfulness and psychotherapy.

Several studies (Didden, Korzilius, van Oorsouw, & Sturmey, 2006; Matson, et al., 2008; Murphy, Healy, & Leader, 2009) have noted the positive outcome of the use of applied behavior analysis for effective behavioral change specifically on aggression, however not many of these articles focuses on the internal factors that contribute to an increase in aggression in adults with intellectual disabilities. Taylor (2002) indicates that there are four categories of treatment which all require different interventions. For example, he described level 1 as a reactive strategy in which it requires emergency medication and or seclusion. Level 2 consists of an environmental response which requires environmental change. Level 3 is considered a contingency management intervention which indicates the use of applied behavior analysis principles, such as reinforcement to support behavioral change. Level 4 involves teaching the client new skills, such as relaxation training that will promote behavior change.

The research on the different behavioral interventions with adults diagnosed with intellectual disability has a long history, for example, Taylor (2002) conducted a literature review on articles that consisted of aggression with adults with intellectual disabilities and found that more aversive behavioral treatments were used to control behavior change in articles published between 1981 and 1985. He also found that less intrusive behavior modification was more effective for managing aggression then the psychopharmacological and aversive approach (Taylor, 2002). He indicated that there was no significant evidence to support the use of psychotropic medication in reducing aggression. However, evidence has shown that cognitive-behavioral interventions have proven to be effective in behavioral change (Taylor, 2002).

The use of psychological methods and cognitive behavioral treatment to effectively modify behavior has also proven to be effective (Adkins et al., 2010; Singh et al., 2003; Singh et al., 2010; Singh et al., 2011a; Sturmey, 2004; Taylor, 2002; Whitaker, 1993). Psychological approaches include antecedent control, skills training, contingency management, and relaxation techniques (Taylor, 2002).

Stress is another important factor that contributes to the increase of aggression in adults with intellectual disabilities. Recent research offers insight about the use of alternative stress-management interventions for people with intellectual disabilities (Wigham & Emerson, 2015). For instance, Hartley and MacLean (2009) have investigated the use of coping strategies. Cognitive-behavioral interventions, such as relaxation, anger management, and social skills training alongside cognitive methods (Sturmey, 2004) may also be effective for adults with intellectual disabilities. The use of

cognitive behavioral therapy is empirically supported for the treatment of anxiety (Taylor, et al., 2017). According to the Florida Developmental Disabilities Council (2009), adults with intellectual disabilities faces many challenges, such as social relationships, negative social interactions, and experiences that lead to an increase of stress and anxiety.

Circumstances as the ones mentioned above can be daunting to the individual. Without the adequate coping strategies and resilience, these stressors put them at higher risk of mental disorders (Florida Developmental Disabilities Council, 2009). Phobias, anxiety, generalized anxiety disorders, obsessive compulsive disorders (OCD), ADHD, conduct disorder, and oppositional defiant disorder are just a few of the challenging disorders experienced by those with intellectual disabilities (Florida Developmental Disabilities Council, 2009). These disorders also place them at higher risk of behavioral challenges.

Gillott and Standen (2007) conducted a study of 34 individuals with autism and 20 adults with intellectual disabilities. Anxiety and stress informant-based questionnaire were used to determine the extent of anxiety and stress levels. According to Gillot and Standen research indicated a higher standard of stress and anxiety with those diagnosed with autism due to the behavior associated with the disorder compared to the comparison groups. However, individuals with intellectual disabilities continue to experience stress and experience the full range of affective disorders (Bramston & Fogarty, 1995). Lack of communication, accurate assessments, and psychiatric co-morbidities make it much

harder to diagnose stress and anxiety in those diagnosed with intellectual disabilities (Davis, Saeed, & Antonacci, 2008).

Anxiety and Other Disorders

Anxiety disorder is one of the most common diseases for individuals with mental disabilities (Florida Developmental Disabilities Council, 2009). Anxiety is the body's normal reaction to stress (Francesco, Mauro, Gianluca, & Enrico, 2010). However, it becomes a concern when both stress and anxiety become excessive, interferes with everyday life, and can therefore become a disabling disorder (Francesco et al., 2010). According to the DSM-5 (APA, 2013) there are several classifications of anxiety, including Panic Disorder, Generalized Anxiety Disorder (GAD), Specific Phobia's, which includes Agoraphobia, Post-Traumatic Stress Disorder (PTSD), Acute Stress Disorder, and Obsessive-Compulsive Disorder (OCD).

Although anxiety is prevalent among individuals diagnosed with intellectual disability, the ID often overshadows the presence of the anxiety disorder, so these individuals are under-diagnosed for existing and comorbid anxiety (Davis, Saeed, & Antonacci, 2008 p 250) which places it difficult to diagnosis. Idusohan-Mozier, Sawicka, Dendle, and Albany (2015) indicate that people with intellectual developmental disabilities are at a higher risk of developing anxiety and depression due to the increase of social exclusion, discrimination, internal and external stigma and inadequate social and emotional support (p 94).

Reid et al., (2011) conducted a point prevalence study of anxiety on 1023 adults diagnosed with intellectual disability to determine the associating factors that contributed

to the individual's anxiety level. Results indicated that 3.8% of the cohort had anxiety disorder (Reid et al., 2011) with associated factors; employment, long-term hospitalization, and recent life events were some of the factors that contributed to the prevalence rate of anxiety in those diagnosed with intellectual disabilities.

The presence of anxiety in those diagnosed with mental disabilities is underreported and underdiagnosed (Idusohaan-Mozier et al. 2015). Untreated anxiety not only leads to an increase in psychological concerns, such as stress, but also increases the chances of the individual engaging in challenging behavior (Idusohan-Mozier et al. 2015), such as self-injurious behavior (SIB) and physical aggression. Untreated anxiety may manifest as a behavioral disorder (Florida Developmental Disabilities Council, 2009). Multiple responses can be exhibited in those with anxiety and intellectual disability, for example, components from behavioral, physiological, verbal and affective domains (Hagopian & Jennett, 2008) are usually seen with increased anxiety levels.

There are several classifications as mentioned above, such as phobias and OCD. According to Davis et al., (2008) co-morbidity is very common in those diagnosed with intellectual disabilities, for example, they may exhibit disorders such as generalized anxiety and or obsessive-compulsive disorder. These disorders are seen at higher rates than in the general population (Davis et al., 2008).

According to the Florida Developmental Disabilities Council (2009), those diagnosed with a phobia are usually concerned with a fear related to a person, place or situation. Skaret, Kvale, & Raadal (2003) state that phobic anxiety is considered a consequence of fearful or aversive experiences in a given case. For example, the intense

fear of dental visit/treatment in those diagnosed with intellectual disability is a major concern as to why there is an overall reduced quality of oral health in those individuals with intellectual disabilities (Miyawaki, Kohjitani, Maeda, Egusa, Mori, Higuchi, Kita, & Shimada, 2004).

Obsessive-Compulsive Disorder (OCD) is another form anxiety that has a high prevalence (Florida Developmental Disabilities Council, 2009) in those diagnosed with intellectual disability, which usually goes undetected and untreated (Gautam & Bhatia, 2015). OCD is defined as the desire to complete activities and intrusive thoughts that are repeated over and over in their mind (Florida Developmental Disabilities Council, 2009), for example, an individual with OCD will engage in repetitive behaviors such as, running back and forth or turning the light on and off. According to Gautam and Bhatia (2015), OCD has a behavioral phenotype specifically with those that are Down Syndrome and with Prader-Willi's Syndrome.

Generalized Anxiety Disorder (GAD) is another type of anxiety with a high prevalence among those with intellectual disabilities. The overall population rate of GAD is 18%; among individuals with intellectual disabilities, 44% experience GAD (Reid et al., 2011) The DSM-5 defines generalized anxiety disorder as excessive worry and anxiety about a variety of topics, event or activities (APA, 2013).

There is a lack of research on the assessment and treatment of anxiety with those diagnosed with intellectual disability compared to the research of those with typical development (Hagopian & Jennett, 2008). During the past 35 years, Hagopian & Jennett indicate that only 48 articles studied the relationship between anxiety and those

diagnosed with intellectual disabilities, whereas the literature on the studies of children without intellectual disabilities has increased during the past few years.

There are several rating scales that are used to determine anxiety levels in those with intellectual disabilities. However, these scales are sometimes unreliable and should be catered to their cognitive level of functioning and language limitations (Hagopian & Jennett, 2008). The Glasgow Anxiety Scale, the Fear for Adults with Mental Retardation (FSAMR) and the Anxiety, Depression, and Mood Scale (ADAMS) Hagopian and Jennett have been effective in diagnosing anxiety in those with intellectual disabilities.

Behavioral interviews and direct observation is another tool that is helpful in providing an overview of anxiety in those with intellectual disabilities. The responses associated with anxiety can sometimes be mistaken for behaviors related to other concerns, such as aggression and property destruction as an attempt to avoid or escape a situation (Hagopian & Jennett, 2008), therefore it is important to ensure that the function of the behavior is operationally defined and that all controlling variables of anxiety is accounted for (Hagopian & Jennett, 2008) when making a determination that the behavior is anxiety provoking. There is pragmatic value in understanding both the level of anxiety and the variables associated with anxiety. This insight can effectively guide treatment (Gillott & Standen, 2007).

As mentioned, the variety of treatment of anxiety varies from clinician to clinician. The literature of treatment methods for anxiety is very limited for those diagnosed with intellectual disabilities (Hagopian & Jannett, 2008). Treatment can vary between the various forms of anxiety, as mentioned above. Interventions including CBT,

positive person behavioral support, relaxation techniques, mindfulness, and meditation have all proven to be effective treatment modalities.

Cognitive Behavioral Therapy is an evidence-based intervention that is considered the most effective and the most utilized for the treatment of anxiety (Otte, 2011). CBT although effective has not been the first choice of therapeutic intervention for those diagnosed with intellectual disabilities because of the lack of ability to cognitively understand what CBT is and its components (Taylor, Lindsay, & Willner 2008), however, there is some evidence that approaches to therapy using CBT is becoming more widely accepted (Taylor et al., 2008).

Cognitive Behavioral Therapy has evolved from the theoretical framework of classical and operant conditioning (Compton, et al., 2004) in that it uses a behavioral and cognitive approach to changing behavior. Components of Cognitive Behavioral Therapy are all intertwined into behavioral change using non-meditational and meditational (thoughts and feelings) factors (Compton et al., 2004).

The use of CBT as a form of intervention with the intellectual disabilities population in treating anxiety is a practical approach as it can be used to teach clients to recognize feelings, maladaptive thoughts, and learn how to minimize avoidant behaviors (Semple, Reid, & Miller, 2005). Relaxation is a component of CBT that is used to teach individuals coping strategies and stress reduction. The use of mindfulness and meditation is also associated with relaxation (Chiesa, Calati, & Serreti, 2011; Idusohan-Moizer et al., 2015; Semple et al., 2005; Singh et al., 2003; Weijer-Bergsma et al., 2012) that is used to treat adults with anxiety disorders.

Yoga, Deep Breathing, and Progressive Muscle Relaxation

There are several components of a mindfulness-based stress reduction program that many practitioners follow, for example, sitting meditation, is a practice that is taught while practitioners focus their attention on their breathing, the present moment, and shifting their attention to any observations, sensations that one may feel (Fix & Fix, 2013) while in a sitting position. If their attention is diverted by a wandering thought; their breath should be used to help in re-focusing them back to the present moment.

Yoga practices along with mindfulness-based procedures can promote both physical and mental wellbeing. Yoga is a mind-body physical intervention practice that has a holistic approach for improving strength, flexibility, and deep breathing, while also releasing tension and stress (Butzer, et al., 2015). Harinath, Malhotra, Pal, Prasad, Kumar, Kain, Rai, & Sawhney (2004) state that yoga practices also promote physiological profile in reducing systolic blood pressure, and even increasing melatonin to increase sleep patterns.

Studies conducted (Butzer et al., 2015; Khalsa, Greiner-Ferris, Hofmann, & Khalsa, 2015; Koenig, Buckley-Reen, & Garg, 2012) investigated the use of yoga practices with children to reduce behavior, and anxiety in a school setting which indicates an overall reduction in symptoms and an overall increase in well-being both physically and mentally. As reported by Koenig et al., (2012) yoga is considered a complimentary approach that has significantly increased from 2002 to 2007 as it has been identified as the most frequent therapeutic intervention with children at both clinics and school-based practices (Koenig et al., 2012). This approach along with mindfulness has been proven to

be effective in those with mood, stress, anxiety, chronic pain, cancer, and OCD which is why both are used in conjunction with each other (Koenig et al., 2012) as it evokes the relaxation response (Khalsa et al., 2015) during a heightened state of stress.

Hatha Yoga is a systematic movement of the body that emerged from the Hindu tradition over 4,000 years ago (Riley, 2004). Traditional Hatha Yoga includes multiple components. For example, according to Riley (2004), yoga includes asanas (physical exercises, or postures), pranayama (deep breathing exercises) and meditation. Together, these three components form the most popular form of Hatha Yoga in modern western culture (Riley, 2004). Hatha Yoga has been effective in the treatment of illness, such as those dealing with the autonomic nervous system, but also those with the neuromuscular system (Riley, 2004), which in turn increases the relaxation response.

Deep breathing and Progressive Muscle Relaxation (PMR) are two other components which are used during a mindfulness-based stress reduction program. Deep breathing or diaphragmatic breathing is best used during a flight or fight response and or when symptoms associated with anxiety are present, such as panic attack (Paul, et al., 2007). Deep breathing is said to have a calming effect on the practitioner as it also provides a balancing of the autonomic nervous system (Brown & Gerbarg, 2005).

Brown and Gerbarg (2005) and Paul, Elam, and Verhulst (2007) conducted studies using deep breathing in reducing anxieties and stress and found that yogic breathing can have both physiological effects on the mind and body, for example, Harinath, et al., (2004) states that these techniques can improve cardiorespiratory performance and plasma melatonin. Both studies indicated positive effects on the body, a

reduction in stress and depression levels, but also contributed to a state of calm alertness (Brown & Gerbarg, 2005).

Progressive Muscle Relaxation (PMR) developed by Dr. Jacobson in 1929 (Matsumoto & Smith, 2001) is another relaxation technique that is widely used in clinical and health psychology (Matsumoto & Smith, 2001). PMR involves the use of tensing specific muscle groups and then releasing then as it evokes the relaxation response. PMR along with deep breathing is effective in reducing somatic arousal and physical symptoms (Matsumoto & Smith, 2001 p 1152).

Mullins and Christian (2001) conducted a case study with a boy diagnosed with autism and mild intellectual disability and taught progressive relaxation to reduce disruptive behavior. Progressive relaxation consisted of progressive muscle relaxation. The PMR script was abbreviated as to be adapted to the individual's level of function. Three conditions were used, relation before the activity, cured relaxation, and no relaxation. This multiple baseline design was used to determine the efficacy of the intervention. Results indicated an increase in relaxation after performing the procedure and showed a significant decrease in disruptive behavior (Mullins & Christian, 2001).

The effects of progressive muscle relaxation in reducing anxiety have been promising and have shown to improve the overall quality of life for individual with anxiety and other psychological disorders (Cheung, Molassiotis, & Chang, 2003). Cheung et al., (2003) investigated the efficacy of progressive muscle relaxation on anxiety and the quality of life in patients diagnosed with colorectal cancer. The authors used a randomized controlled trial in which they taught PMR for ten sessions. Results

were reported with an overall increase in quality of life and a reduction in anxiety levels post treatment.

There are several mechanisms associated with the use of progressive muscle relaxation in reducing stress and anxiety, for example, Dolbier and Rush (2012) state that tension of the muscles alleviates tension and enhances the feeling of stress. Being able to mentally focus one's attention to the tension of the specific muscle groups provides a focus on the stimuli (Dolbier & Rush, 2012), while cognitively diverting one's attention away from the stress state.

Dolbier and Rush (2012) conducted an Abbreviated version of Progressive Muscle Relaxation (APMR), where just the larger groups were focused on rather than, the smaller groups. Progressive muscle relaxation typically last about twenty to forty minutes (Dolbier & Rush, 2012). However, studies have shown the efficacy of AMPR just as effective as the traditional PMR. Physiological indicators of stress have also been shown to decrease using both APMR and PMR, for example, the blood pressure, and cortisol levels (Dolbier & Rush, 2012; Pawlow & Jones, 2002; Rainforth, et al., 2007).

Mindfulness-Based Stress Reduction and Anxiety

Studies (Bohlmeijer, Prenger, Taal, & Cuijpers, 2010; Evans, Ferrando, Findler, Stowell, Smart, & Haglin, 2008; Goldin & Gross, 2010) have shown that mindfulness interventions lead to improvements in depression and anxiety symptoms. Research indicates that mindfulness also contributes to the improvement of negative emotion experiences, and increases brain activity with attention (Goldin & Gross, 2010). According to Toneatto and Nguyen (2007), mindfulness may produce improvements with

anxiety symptoms by interrupting the depressogenic or anxiogenic negative thought pattern.

Mindfulness has been used with various populations for the treatment of anxiety. For example, Piet, Wurtzen and Zachariae (2012) conducted a systematic review and meta-analysis using Mindfulness-Based Therapy (MBT) with 1,403 participants that were diagnosed with cancer. The purpose of the study was to identify the effects of a mindfulness based therapeutic program on the symptoms of anxiety and depression. The researchers conducted an electronic search on studies that were relevant to MBT. Criteria such as the type of study, the type of participants, the type of intervention used, and the outcome measure were all criteria used for research eligibility. Researchers found that the use of MBT was effective in reducing anxiety and depressive symptoms within the non-clinical population (Piet et al., 2012).

Mindfulness based procedures for clinical purposes have had beneficial outcomes on the treatment of depression and anxiety disorders (Taylor et al., 2008). Mindfulness allows one to decrease their dysphoric mood state (Taylor et al., 2008 p 1524) while also promoting self-regulating thought process. This process of self-regulation and changing one's thought process has been conceptualized as an effective strategy for the use of adults diagnosed with Generalized Anxiety Disorder (GAD) by Evans et al., (2008).

GAD as defined by Evans et al., (2008) can be characterized by excessive worry, distress and impairment in social and occupational functioning. According to the National Institute of Mental Health (2017) the prevalence rate of generalized anxiety disorder is 3.1% of the United States adult population. Evans et al. (2008) conducted a

study with eleven participants incorporating a mindfulness based cognitive therapeutic program for 8 weeks.

The mindfulness procedure consisted of self-reported measures of anxiety, worry, depressive symptoms, and mindfulness awareness (Evans et al., 2008). The mindfulness procedure derived from Kabat-Zinn's mindfulness program which includes body scanning, meditation, sitting meditation, and gentle yoga. Mindfulness eating and mindfulness walking was also introduced into the program. Several measures, such as the Becks Anxiety Inventory (BAI), Becks Depression Inventory- II (BDI-II), Penn State Worry Questionnaire (PSWQ), Profile of Mood State (POMS), and The Mindfulness Attention Awareness Scale (MAAS) were used to measure the participant's anxiety, depression, and meditation awareness levels post treatment and after treatment. Evan et al., (2008) concluded that the mindfulness procedure was effective in reducing anxiety and mood symptoms of those with GAD, while also increasing awareness levels.

Relaxation, meditation techniques, and even biofeedback are strategies that are currently used in clinical practice for the treatment of anxiety (Kabat-Zinn et al., 1992). All three significantly play a role in effectively reducing psychological and physiological symptoms of anxiety in the normal population. Kabat-Zinn et al., (1992) indicates that relaxation and participation in stress reduction programs can even benefit patients that are not classified within a diagnostic criterion of psychological disturbances. For example, meditation strategies were used on patients that complained of chronic pain. Patients that participated in a stress reduction or relaxation program reported an improvement in their

overall state of anxiety. Similar results were also reported by patients with stress-related medical disorders (Kabat-Zinn et al, 1992).

Mindfulness-Based Stress Reduction and Aggression

Researchers have also investigated the use of mindfulness with the management or reduction of psychological stress (Singh, et al., 2017 p 65). The ability to self-regulate emotion is an important and beneficial component of mindfulness (Singh et al., 2017). Fix and Fix (2013) state that aggressive behavior is relatively seen at a high frequency in the United States and has become a serious issue to society; as a result, occurrences of physical assault, child abuse, and emergency room visits due to related injuries from aggression is a significant concern. There is an increasingly vast amount of research (Fix & Fix, 2013; Samuelson, et al., 2007; Taylor, 2002; Wongtongkam, Ward, Day, & Winefield, 2014) that indicates the use of mindfulness for the reduction of aggression. Fix and Fix conducted a meta-analysis on various studies that focused on aggression and Mindfulness-Based Treatments (MBTs).

Initially 231 articles were used for the study; however, 128 articles did not meet criteria based on the primary focus on MBTs for aggression. The articles that met criteria were organized by design and evaluated for the efficacy of MBTs. Fix and Fix (2013) indicate that although effective, there is weak research on the use of MBTs. The suggestion was based on weak design, which limited the validity of the results (Fix & Fix, 2013) and therefore future research is warranted to identify appropriate means to assess the effectiveness of mindfulness.

Aggression can become a problematic response that usually results in injury to self, peers, family and staff (Fix & Fix, 2013). Using the mindfulness approach, one can develop strategies that focus one's attention on the present moment (Fix & Fix, 2013; Kabat-Zinn, 2003; Shapiro, et al., 1998). Borders, Earleywine, and Jajodia (2010) found that an increase in mindfulness was correlated with less anger, and hostility. Diebold (2003) indicates that there are several ways in which individuals express their anger through motor and verbal expression and hostile verbalizations. 80% of the triggers for anger consist of "unwanted and sometimes unexpected aversive interpersonal behavior" while 70% of these events usually occur with someone close to one another (p 7). These events are perceived to activate the anger response (Diebold, 2003).

Essentially the use of mindfulness has led to positive outcomes within all areas of clinical interest. However, only recently have studies focused on the use of mindfulness in treatment of aggression (Borders, Earleywine, & Jajodia, 2010). The purpose of integrating a mindfulness procedure to reduce aggression is to ensure proper teaching of focusing on the present rather than on past events or future occurrences of situations (Borders et al., 2010). Eliminating judgmental thought processes and increasing acceptance are two practicing methods of mindfulness, which provide elimination of negative internal and external events (Borders et al., 2010).

Mindfulness-Based Stress Reduction and the Brain

Neuro-imaging and biofeedback have both been promising tools that are used to determine changes in brain activity when conducting mindfulness programs, such as MBSR (Hölzel et al., 2011). Kimpatrick et al., 2011 found that meditation and

mindfulness practices can lead to altered functioning of brain networks that is involved with attention and sensitivity to internal and external sensations and emotions (p 290). A large body of research focusing on the brain and mindfulness has demonstrated significant changes in neurological activity regarding the gray matters in the specific brain regions in response to mindfulness stress reduction programs (Hölzel et al., 2011). Specific parts of the brain region such as the hippocampus and the right anterior insula have both been identified as having been activated during meditative state (Hölzel et al., 2011).

Although the studies in behavior changes due to meditation is important, research conducted on brain activity is just as important as it identifies the connection to the biological, physiological and psychological aspect of the brain and meditation. Meditation has shown to alter behavior (Davidson, et al., 2003), but moreover the brain's activity and its response to emotional challenges.

Pagnoni and Cekic (2007) indicated that studies conducted by the Department of Psychiatry and Behavioral Science at Emory University in Atlanta showed how meditation affects the gray matter in the brain. Studies show that the volume of gray matter in the brain does not reduce in those that practiced meditation regularly compared to those that did not practice meditation (Hölzel et al., 2011; Luder, Toga, Lepore, & Gaser, 2009; Pagnoni & Cekic, 2007). Hölzel et al., 2003 conducted a similar study introducing eight weeks of MSBR (guided imagery, body scan, yoga, and sitting meditation) to individuals for 45 minutes. Meditation practices were integrated into their daily lives, such as mindful eating, and mindful walking. Biomedical imagining was

conducted before the teaching of mindfulness after the eight weeks. Results indicated an increased volume in the gray matter of the hippocampus region of the brain, which indicates an increase in concentration, learning, memory and emotional regulation (Hölzel et al., 2011).

Self-regulatory control is an important factor that contributes to an adult with intellectual disability's inability to control behavioral challenges. According to the Florida Developmental Disabilities Council (2009) disturbances in the brains function associated with regulatory control has been seen in those diagnosed with Attention-Deficit Hyperactivity Disorder (ADHD), Bipolar, Tourettes, and Obsessive-Compulsive Disorder (OCD).

Gap in the Literature

In my literature search, I found approximately 150 articles which addressed mindfulness training in adults with autism and intellectual disabilities. The literature (Harper, et al., 2013; Hart & Robbins, 2014; Robertson, 2011; Singh et al., 2003a; Singh et al., 2007b; Singh et al., 2008) indicates the use of relaxation training, mindfulness, progressive muscle relaxation in reducing symptoms of anxiety and depression in this population. However, the literature does not address the use of a mindfulness-based stress reduction program in reducing specific behaviors in adults with intellectual disabilities, such as physical aggression. As we can see from the prevalence rate of 2-20% aggressive behavior (Allen, 2000) there is a significant need in understanding the function of a mindfulness-based stress reduction program in reducing specific behaviors.

Conclusion

There is a gap in the literature regarding research on the use of a mindfulness-based stress reduction program in reducing specific behaviors, such as physical aggression, in adults with intellectual disabilities. According to Sequeira and Ahmed (2012) meditation is beneficial in restoring and balancing the complex human systems that deals with energy. It helps in overcoming the obstacles associated with physical and psychological challenges (Sequeira & Ahmed, 2012) faced by those with intellectual disabilities.

A powerful understanding of mindfulness, meditation, and movement therapy, such as yoga have shown promising effects in treating and reducing behavioral problems (Rosenblatt et al., 2011). Considering the research that focuses on anxiety, or other psychological concerns, the use of a MBSR program would provide a non-pharmaceutical approach for dealing with behavioral challenges in those diagnosed with autism and intellectual disabilities.

There is a demonstrated need to further enhance our understanding of intellectual disabilities and their impact on quality of life. MBSR offers potential to improve the overall quality of life for thosediagnosed with intellectual disabilities, and reduce the use of psychotropic medication. The next chapter will discuss the research methodology, based on a quantitative approach to assess the effectiveness of a pretest-posttest control group design. The research methodology will focus on identifying the significant effect of the treatment. It will also discuss the setting, sample, instrumentation that was used and the analysis of the secondary data that was presented to the researcher.

Chapter 3: Research Method

Introduction

The first two chapters provided the background of the literature regarding the implementation of mindfulness among individuals with intellectual disabilities. The purpose of this study was to determine whether a MBSR program would reduce aggression in a group of adults diagnosed with intellectual disabilities. This section describes the research design that was conducted at the facility, the target population, its sampling procedure, data collection, the treatment method, any ethical considerations, and a description of how the data were analyzed.

Research Design and Sample Size

Secondary data were collected from an agency that provides day habilitation services to the participants. This was secondary analysis of clinical records to assess the effectiveness of a therapeutic approach offered at a day habilitation service center. The purpose of this pretest-posttest with a waitlist control group experimental design was to determine whether a MBSR program can reduce aggression in the intellectual disabilities population. The independent variable in this study were the two groups, those that received the intervention and those that did not receive the intervention. The dependent variable was the MOAS, as this measurement tool determines the extent of various aggression in terms of its severity and frequency over time. The MOAS is used by the facility to measure aggression levels in facility participants, and the facility indicated willingness to share their pretest and posttest MOAS measures for secondary data analysis of clinical records. Kenny (1975) indicated that there are several factors for

establishing a determination to a pretest-posttest design; for example, a study must consist of a treated and untreated group, a pretest and posttest measure, and lastly a clear hypothesis of treatment effects.

The mindfulness program had two purposes: to improve the quality of life for individuals with intellectual disability and teach better coping strategies to those individuals when faced with agitation and or aggression. The following research questions were formulated:

RQ1: What is the effect of training adults with mild intellectual disabilities in MBSR techniques on aggression (severity and intensity of physical aggression, verbal aggression, aggression against property, and autoagression) as measured by the MOAS?

$H_0 1$: Adults with mild intellectual disabilities who received training in MBSR techniques will show a decrease in aggression (severity and intensity of physical aggression, verbal aggression, aggression against property, and autoaggression) relative to those who did not receive training in MBSR techniques.

$H_a 1$: Adults with mild intellectual disabilities who received training in MBSR techniques will not show a decrease in aggression (severity and intensity of physical aggression, verbal aggression, aggression against property, and autoaggression) relative to those who did not receive training in MBSR techniques.

RQ2: What is the effect of time of assessment (preintervention with MBSR techniques and postintervention with MBSR techniques) on aggression (severity and intensity of physical aggression, verbal aggression, aggression against property, and autoaggression) in adults with mild intellectual disabilities?

$H_0$2: There will be a reduction in aggression (severity and intensity of physical aggression, verbal aggression, aggression against property, and autoaggression) in adults with mild intellectual disabilities at the posttest assessment relative to the pretest assessment.

H_a2: There will not be a reduction in aggression (severity and intensity of physical aggression, verbal aggression, aggression against property, and autoaggression) in adults with mild intellectual disabilities at the posttest assessment relative to the pretest assessment.

RQ3: What is the effect of training adults with mild intellectual disabilities in MBSR techniques on mindfulness as measured by the Child and Adolescent Mindfulness Measure (CAMM)?

$H_0$3: There will be an increase in mindfulness as measured by the CAMM on adults with intellectual disabilities.

H_a3: There will not an increase in mindfulness as measured by the CAMM on adults with intellectual disabilities.

RQ4: What is the effect of time of assessment (preintervention with MBSR techniques and postintervention with MBSR techniques) on mindfulness in adults with mild intellectual disabilities?

$H_0$4: There will be an increase in mindfulness (preintervention with MBSR techniques and postintervention with MBSR techniques) in adults with intellectual disabilities.

H_a4: There will not be an increase in mindfulness (preintervention with MBSR techniques and postintervention with MBSR techniques) in adults with intellectual disabilities.

Thirty-six participants were assessed using the MOAS measurement tool, which was used to determine the frequency and severity of physical aggression, verbal aggression, aggression towards others, and autoaggression. The MOAS was completed with assistance from the Director of Psychology and behavior interventions specialist weekly for 3 weeks before the treatment session as well as weekly for 3 weeks after the termination of the treatment session. The MOAS consists of a scoring criterion where the score for each category is added, multiplied by the sum of weight, and then added in a total weighted score. The mean score determined significant changes in behavior over a specific time. To determine a correlation and relationship between age and the measure an analysis of covariance (ANCOVA), covarying for age was used. Since there was no relationship between the variables, an ANOVA (analysis of variance) was conducted. A 2 x 2 ANOVA was conducted to examine for differences in MOAS scores between pretest and posttest and by group. A 2 x 2 ANOVA **w**as conducted to examine for differences in terms of CAMM scores between pretest and posttest, and by group. This analysis was done using SPSS version 25.0 for windows.

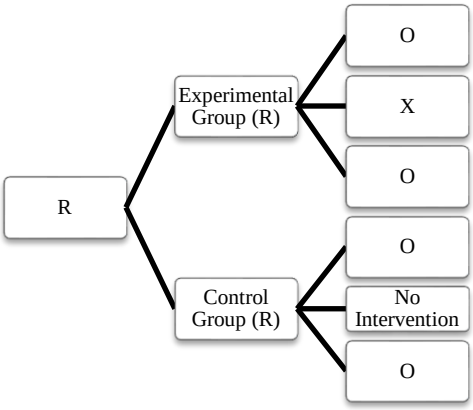

Figure 1. Description of the pretest-posttest design where R represents randomization of participants, O represent the assessment of the MOAS Instrument, and X represents the mindfulness program.

The size of the sample was calculated by identifying the statistical power and alpha levels. Statistical power was input into G*Power analysis software, a program designed to compute participant size. A statistical power of .80 and an alpha level of .05 estimated a needed sample size of 34 total participants. The 36 study participants in both the study and control group had a mean age of *47.3 (SD* = 14.7).

Population, Setting, and Instrument

Population

The target population for this study was individuals diagnosed with mild intellectual disabilities. The severity of the individual's cognitive level of functioning was determined by their psychological evaluation which was obtained from the Director of Psychological Services before the start of the study. Criteria were set to those that are in the higher functioning range of intellectual disability as they have a better understanding of the concept of the procedure; therefore, those that are diagnosed with Mild to Moderate intellectual disabilities were chosen to participate. The population age

range was between the ages of 21-77 years, including 16 males and 20 females. Within those that are participating in the mindfulness program 11 were females and 7 were males. The wait-list control group included 8 females and 10 males. The ethnicity of the participants varies as there were no specific ethnicity criteria set for participating in the study.

Individuals that participated in the program that are diagnosed with mild intellectual disability and a diagnosis code of 319.F70 (APA, 2013) and diagnoses of moderate intellectual disability with a diagnosis code of 319.F71 (APA, 2013) were eligible to participate in the mindfulness procedure. To participate in the mindfulness procedure, participants had to: have a history of engaging in aggression, whether physical, verbal, property aggression or self-injurious behavior; and be able to cognitively understand the concept of mindfulness or at least grasps the components of closing their eyes and paying attention to their breath. All those who showed interest in participating in the mindfulness program were accepted if eligible, and once enrollment reached 18 participants, the rest of the individuals were placed in the control wait-list group. Wait list participants received the mindfulness training after data collection was completed.

Individuals who participated in the mindfulness program attended the day facility and were on a person-centered support plan for the specified target responses of physical aggression. According to Artesani and Mallar (1998), a person-centered plan provides a deeper understanding of the challenging behavior. In the case of the participants, all individuals were on a person-centered support plan that provided positive approaches to

replacing behaviors, such as receiving verbal praise in the absence of challenging behavior.

There are three classes at the facility, but due to the total number of adults in all three classes, the intervention was initiated with two classes (36 participants) to keep the size of the class to a reasonable number based on staff availability. The third class (control group), which was comparable to the treatment group in all intellectual and demographic characteristics, received the intervention several weeks after the initial intervention was concluded. Participant selection within the facility was based on the individual's ability to understand the concept of mindfulness and its intervention procedures will result in participants in the mild intellectual disability category. There are three classrooms meeting these criteria and students in two of the classrooms were selected as a matter of convenience to receive the treatment while the third classrooms were assigned to control group status.

Setting

ABC is a non-profit agency that provides various services for adults diagnosed with intellectual disabilities. Services include day program services, residential services, and Medicaid service coordination. Approximately 185 individuals diagnosed with various levels of functioning and related disabilities receive day program services at the specific facility. There is a gym area that is used for concerts and events, in which the mindfulness program will be held.

Individuals that attend the program partake in various services areas/classrooms, such as self-care (a service area that teaches daily living skills), or the cognitive service

area (where individuals are taught cognitive tasks that require problem-solving and thinking). Other specific areas include the community entry area, which teaches the individuals vocational skills for entering the community for employment.

There are various levels of support provided by the facility, such as assistant instructors and instructors. Instructors and assistant instructors work on a one-to-one basis with the individuals and provide the support needed to achieve their service area goals. There are several support staff, including day program coordinators who provide supervision to the instructors and assistant instructors. These day program coordinators ensure that day program services are being rendered in an appropriate manner and act as a liaison between the day program and residential setting.

There were two Masters level psychologists who served an important role in the day program facility. The program psychologist ensured that the individual is receiving proper psychological services, receiving appropriate psychiatric services and is a liaison between psychiatrist, psychologist and residential setting in terms of managing maladaptive behavior. The program psychologist ensured the person-centered support plan is written according to the individual's behavior and is overseen by a Licensed Clinical Psychologist. Permission to analyze secondary data was granted by the Director of Day Services and the Assistant Executive Officer.

Instrument

Proper documentation of aggression is extremely critical when conducting a study of this magnitude (Silver & Yudofsky, 1991). Yudofsky and Silver (1991) developed the MOAS instrument as a measurement tool that is used to assess the severity and frequency

of aggression. Oliver, Crawford, Rao, Reece, and Tyrer (2007) state that the MOAS is a tool that should be used when interventions are aimed in reducing aggressive behavior in those diagnosed with intellectual disabilities (Silver & Yudofsky, 1991).

Modified Overt Aggression Scale

The MOAS is divided into four sections that are labeled: verbal aggression, physical aggression towards self, physical aggression towards objects, and physical aggression towards others. Each category contains statements of the topography of the behavior (Silver & Yudofsky, 1991), a scale of 1-4 is provided indicating the severity of the behavior, for example, verbal aggression: makes loud noises would be 1 whereas threats to others, self would be a rating of 4. Minimum scale score (for lowest level of aggression) is zero and maximum score (for highest level of aggression is ten). The facility modified the MOAS to include the frequency measure for each type of aggression.

Several modifications of the MOAS have been conducted, which all have resulted in acceptable levels of reliability and validity (Cohen, Tsiouris, Flory, Kim, Freedland, Heaney, Pettinger, & Brown, 2010). Several studies (Chukwukekwu & Stanley, 2008; Cohen et al., 2010; Oliver, Crawford, Rao, Reece, & Tyrer, 2007; Tyrer et al., 2008) using the MOAS on aggression with varies psychiatric populations has also proven to be a reliable and valid construct based on consistency, assessment, and both internal and external validities.

To determine validity and reliability of the MOAS, several measures were constructed to ensure effectiveness. Cohen, Tsiouris, Flory, Kim, Freedland, Heaney,

Pettinger, and Brown, 2010 used a sample of over 2,000 people using various variables, where results of scores varied with both age and ID level. Diagnostic validity was also used to test with gender differences between variables. This specific validity values showed effective use of the MOAS and shows a reliable global assessment tool.

Once the MOAS is completed, the total sum of all ratings for each type of aggression will be used for analysis as they determined the severity and frequency of the various types of aggression the individual engaged in prior to the intervention and after the intervention. The scale is designed to measure the occurrence of each type of aggression on a 0-4 weighted scale. The ratings of 0-4 refer to the severity of the behavior occurring, and specific examples are listed for each rating. Therefore, more than one item can be checked in each category if that behavior occurred. The total score for each subscale is the weighted sum. Therefore, an individual who demonstrated verbal aggression at all levels might have received a check mark next to the items 1, 2, 3, and 4 which would have resulted in a score of 10 for verbal aggression.

During analysis I used the total weighted sum score for each week to determine statistical differences. I also used the total frequency occurrence of behavior to determine statistical differences.

Child and Adolescent Mindfulness Measure (CAMM)

As seen in appendix E the Child and Adolescent Mindfulness Measure (CAMM) developed by Greco, Baer, and Smith is a ten question likert-type scale used to assess the individual's awareness and the effectiveness of a mindfulness program (Greco, Baer, &

Smith, 2011). To assess the effectiveness of the mindfulness program, each individual was asked to complete the CAMM prior to the intervention and after the intervention.

Rating of the CAMM consist of a 0-4 scale with 0 being never true and 4 being always true. Greco, Baer, and Smith (2011) state that a higher score on the CAMM corresponds to higher levels of mindfulness. Total scores on the CAMM are computed by summing the individual's responses to the ten questions. Scores can yield a range of 0-40, with 40 being very mindful. The CAMM reports a Cronbach's alpha of .81, which indicates consistency and adequate internal validity (Greco, Baer, & Smith, 2011).

Procedures

Collection of secondary data began once Walden University's Institutional Review Board (IRB) has reviewed the application and approved data collection. Approval to collect data was already granted by the agency. I did not have any contact with participants, only to programmatic data, which was collected during the treatment phase by the Director of Psychology and de-identified. Data collected were results from the MOAS and CAMM measures used before and after the mindfulness program. Participants were protected and assigned numbers as this will help in identifying MOAS and CAMM scores. The MOAS and the CAMM was completed prior to treatment and upon termination of treatment. Data collected was paper records that were stored by the agency in a locked area in the record room. Appendix F provides the recording sheet which was used to record all needed information from the de-identified clinical records for use in this secondary analysis.

The mindfulness program was an eight-week program that consisted of several components to the mindfulness-bases stress reduction program, such as body scanning, slight yoga movements, and guided meditation that follows the guidelines of *Soles of the Feet* (Appendix C). Thirty-six participants at the facility were asked if they would like to join a meditation group. All participants are high functioning and fall under the mild to moderate range of intellectual functioning.

Consent to participate in the program was sent to parents and/or advocates describing the use and benefits of participating in a mindfulness-based stress reduction program. The participants and their parents/advocates were advised that the program would meet once a week for 8-weeks and would not interfere with their day program services. The initial assessment was performed by the Director of Psychology when she provided the participants with the MOAS and CAMM instrument.

The mindfulness program did not have any harmful effects (Praissman, 2008). It taught participants alternative coping strategies for dealing with stress anxiety, and aggression. This form of intervention can be useful in the reduction of stress, anxiety, and aggression, and can also provide an alternative approach to medication for managing symptoms associated with stress, anxiety, and even aggression.

Measures Taken to Protect the Participants

All measures were taken to protect the rights of those who participated in the mindfulness program. Consent was provided by the agency allowing the researcher to use secondary data. Data collection that was used was assigned a number. Demographic information, such as name, date of birth, diagnosis was not needed for the mindfulness

program. Data collected was stored by the agency in a locked filing cabinet in the records room.

Attendance was recorded on the MOAS. Make up sessions were not provided during the study. However, all participants were encouraged to attend for their weekly mindfulness session. An analysis of attendance was conducted to determine if greater attendance is related either to increased mindfulness on the CAMM or improved outcome on the MOAS. The skills developed during the eight week program were expected to enhance the individual's ability to cope with stress and manage aggression levels.

Week 1: Introduction to a Mindfulness-Based Stress Reduction Program

Week one consisted of an introduction to mindfulness and its purposes. It also consisted of introduction of each participant and what the individual would like to receive from the meditation course. During the subsequent weeks, various meditation practices were included, such as a guided meditation, progressive muscle relaxation, and body scanning. Some stretching and slight yoga was part of the curriculum as well. A sound bar or singing bowl was introduced before the start of the session and before terminating the session.

Week 2: Introduction to Mindfulness Breathing

Week two consisted of an introduction and practice of mindfulness breathing. Specific props, such as a Hoberman sphere was used as it provides a visualization of the in-breath and out-breath and makes it easier for the participants to grasp the concept of mindfulness breathing. Various meditation music tracks were played during class to enhance the experience.

Week 3 and 4: Mindfulness Breathing and Slight Yoga Poses

Week three consisted of a combination of the slight yoga poses, and mindfulness breathing with assistance from the Hoberman sphere and meditation music. Week four consisted of an introduction to a sitting meditation practice and body scanning. Body scanning diverts the individuals' attention on the breath and then to a specific part of their body (Praissman, 2008). A guided meditation from the Insight Timer cell phone application (Appendix E) was played to provide a more detailed script for body scanning and sitting meditation.

Weeks 5, 6, and 7: Feelings, Emotions, and Being Mindful of One's Emotions

Weeks five, six, and seven consisted of a ten-minute discussion about feelings, emotions, being mindful of their own emotions and the emotion of others, and the implementation of mindfulness during a crisis. This discussion was included in weeks five through seven. Mindfulness breathing was part of the procedure during all sessions; meditation music was also part of the procedure during all sessions. Week eight consisted of a closing discussion about what was learned, their experiences and concluded with a mindfulness breathing technique.

Summary

This chapter provided the research methodology that will be used for the mindfulness program. It reviewed the procedure associated with the mindfulness training that was implemented at the study site, its procedure for data collection, and the data that was used to measure the frequency and severity of the physical aggression. It also discussed the participants, their privacy, and security of the participant data, as well as an

outline of the weekly sessions. Further, the proposed method of secondary data analysis was discussed. The next chapter will provide the findings of the study, information on data collection, and any statistical analysis that will be completed to assist in showing the effects of the mindfulness program.

Chapter 4: Results

Introduction

This chapter outlines the data collection process and results of the study which examine whether or not using a mindfulness procedure had a significant effect on aggression in adults with intellectual disabilities. I hypothesized that there would be a statistically significant reduction in aggression when using a mindfulness procedure in adults with intellectual disabilities. In Chapter 4, I will include information on data collection, descriptive data regarding the demographics of participants in both the study and control group, and findings from the statistical analysis of data.

The study has two purposes:. to improve the quality of life for individuals with intellectual disabilities and to teach better coping strategies to individuals when faced with agitation and/or aggression. The following research questions were formulated:

RQ1: What is the effect of training adults with mild intellectual disabilities in MBSR techniques on aggression (severity and intensity of physical aggression, verbal aggression, aggression against property, and autoagression) as measured by the MOAS?

$H_0 1$: Adults with mild intellectual disabilities who received training in MBSR techniques will show a decrease in aggression (severity and intensity of physical aggression, verbal aggression, aggression against property, and autoaggression) relative to those who did not receive training in MBSR techniques.

$H_a 1$: Adults with mild intellectual disabilities who received training in MBSR techniques will not show a decrease in aggression (severity and intensity of physical

aggression, verbal aggression, aggression against property, and autoaggression) relative to those who did not receive training in MBSR techniques.

RQ2: What is the effect of time of assessment (preintervention with MBSR techniques and postintervention with MBSR techniques) on aggression (severity and intensity of physical aggression, verbal aggression, aggression against property, and autoaggression) in adults with mild intellectual disabilities?

$H_0 2$: There will be a reduction in aggression (severity and intensity of physical aggression, verbal aggression, aggression against property, and autoaggression) in adults with mild intellectual disabilities at the posttest assessment relative to the pretest assessment.

$H_a 2$: There will not be a reduction in aggression (severity and intensity of physical aggression, verbal aggression, aggression against property, and autoaggression) in adults with mild intellectual disabilities at the posttest assessment relative to the pretest assessment.

RQ3: What is the effect of training adults with mild intellectual disabilities in MBSR techniques on mindfulness as measured by the CAMM?

$H_0 3$: There will be an increase in mindfulness as measured by the CAMM on adults with intellectual disabilities.

$H_a 3$: There will not an increase in mindfulness as measured by the CAMM on adults with intellectual disabilities.

RQ4: What is the effect of time of assessment (preintervention with MBSR techniques and postintervention with MBSR techniques) on mindfulness in adults with mild intellectual disabilities?

H_0*4:* There will be an increase in mindfulness (preintervention with MBSR techniques and postintervention with MBSR techniques) in adults with intellectual disabilities.

H_a*4:* There will not be an increase in mindfulness (preintervention with MBSR techniques and postintervention with MBSR techniques) in adults with intellectual disabilities.

Participant Data

A convenience sample from a day program facility was chosen for this study. The agency implemented a MBSR program teaching adults with intellectual disabilities about mindfulness that can assist in reducing aggression. Secondary data analysis of clinical records was used for this study. All participants (N = 36) that participated were invited by the agency.

A total of 18 participants were conveniently chosen to participant in the mindfulness program, while the other 18 participants continued with their regular schedule as part of the control group. However, these individuals were part of a waitlist control group and allowed to participate in the intervention after the completion of data collection. The control group was not interrupted from their daily schedule and was not provided any MBSR during the period of the intervention and data collection.

Participants were provided a pretest measure using the MOAS it determined level and severity of aggression in those that participated in the study.

Participant Characteristics

The overall sample of participants ranged in age between 23-77 years (M = 23.00, SD = 14.71). There were 16 males and 20 females. Within those that are participating in the mindfulness program, the mean age = 43.61, SD = 15.33; there were 12 females and 6 males. The wait-list control group participants had a mean age of 51.06 and SD = 13.46; there were 8 females and 10 males. The ethnicity of the participants consisted of Caucasian (n = 16, 44.4%), African American (n = 13, 36.1%), Hispanic (n = 6, 16.7%), and South Asian (n = 1, 2.8%). For those participating in the mindfulness group, ethnicity of participants consisted of Caucasian (n = 7, 38.9%), African American (n = 8, 44.4%), Hispanic (n = 3, 16.7%). For those participating in the control group, ethnicity of participants consisted of Caucasian (n = 9, 50.0%), African American (n = 5, 27.8%), Hispanic (n = 3, 16.7%), and South Asian (n = 1, 2.8%). Participants were absent for 0 to 1 days, with M = 0.11 days and SD = 0.32. The control group had slightly more absences in comparison to the mindfulness group. Days missed for the control group reflect days missed with ongoing/regular daily classes. Participants primarily diagnosis was moderate (n = 31, 86.1%) as opposed to mild (n = 5, 13.9%). These diagnoses were retrieved from clinical records. Table 2 presents the descriptive statistics for the demographics.

Table 2

Frequency Table for Nominal Variables

Variable	Mindfulness Group (*n* = 18)		Control Group (*n* = 18)		Total (*n* = 36)	
	n	*%*	*N*	*%*	*n*	*%*
Gender						
Female	12	66.7	8	44.4	20	55.6
Male	6	33.3	10	55.6	16	44.4
Ethnicity						
African American	8	44.4	5	27.8	13	36.1
Caucasian	7	38.9	9	50.0	16	44.4
Hispanic	3	16.7	3	16.7	6	16.7
South Asian	0	0.0	1	5.6	1	2.8
Diagnosis						
Mild	3	16.7	2	11.1	5	13.9
Moderate	15	83.3	16	88.9	31	86.1
Days missed						
0	17	94.4	15	83.3	32	88.9
1	1	5.6	3	16.7	4	11.1

Note. n - frequency of sample; *%* - percent relative to sample. Due to rounding errors, percentages may not equal 100%.

A series of Pearson correlations were conducted to examine the strength of association between the MOAS and CAMM pretest and posttest scores. There was not a significant relationship between CAMM Pretest and MOAS Pretest ($r = .15$, $p = .373$). There was not a significant relationship between CAMM Posttest and MOAS Posttest ($r = .11$, $p = .527$). Table 3 presents the findings of the Pearson correlations.

Table 3

Pearson Correlation between MOAS and CAMM

	MOAS Pretest		MOAS Posttest	
	R	*p*	*r*	*p*
CAMM Pretest	.15	.373		
CAMM Posttest			.11	.527

Note. MOAS – Modified Overt Aggression Scale; CAMM – Child and Adolescent Mindfulness Measure; *r* - Pearson correlation coefficient; *p* - level of significance.

Data Analysis

The Statistical Package for the Social Science (SPSS) was used to perform all the analysis in this pretest and posttest examination. Descriptive statistics were first used to explore research questions listed below.

RQ1: What is the effect of training adults with mild intellectual disabilities in MBSR techniques on aggression (severity and intensity of physical aggression, verbal aggression, aggression against property, and autoaggression) as measured by the MOAS?

$H_0 1$: Adults with mild intellectual disabilities who received training in MBSR techniques will show a decrease in aggression (severity and intensity of physical aggression, verbal aggression, aggression against property, and autoaggression) relative to those who did not receive training in MBSR techniques.

$H_a 1$: Adults with mild intellectual disabilities who received training in MBSR techniques will not show a decrease in aggression (severity and intensity of physical aggression, verbal aggression, aggression against property, and autoaggression) relative to those who did not receive training in MBSR techniques.

RQ2: What is the effect of time of assessment (preintervention with MBSR techniques and postintervention with MBSR techniques) on aggression (severity and intensity of physical aggression, verbal aggression, aggression against property, and autoaggression) in adults with mild intellectual disabilities?

$H_0$2: There will be a reduction in aggression (severity and intensity of physical aggression, verbal aggression, aggression against property, and autoaggression) in adults with mild intellectual disabilities at the posttest assessment relative to the pretest assessment.

H_a2: There will not be a reduction in aggression (severity and intensity of physical aggression, verbal aggression, aggression against property, and autoaggression) in adults with mild intellectual disabilities at the posttest assessment relative to the pretest assessment.

RQ3: What is the effect of training adults with mild intellectual disabilities in MBSR techniques on mindfulness as measured by the CAMM?

$H_0$3: There will be an increase in mindfulness as measured by the CAMM on adults with intellectual disabilities.

H_a3: There will not an increase in mindfulness as measured by the CAMM on adults with intellectual disabilities.

RQ4: What is the effect of time of assessment (preintervention with MBSR techniques and postintervention with MBSR techniques) on mindfulness in adults with mild intellectual disabilities?

$H_0$4: There will be an increase in mindfulness (preintervention with MBSR techniques and postintervention with MBSR techniques) in adults with intellectual disabilities.

2 x 2 ANOVA. To address research question one and two, a 2 x 2 ANOVA was conducted to examine for differences in MOAS scores between pretest and posttest, and by group. The between-subjects effect for group was not significant $F(1, 34) = 0.71$, $p = .406$, indicating that MOAS scores were not significantly different between the Mindfulness Program group and control group. The within-subjects effect for time was not significant, $F(1, 34) = 0.88$, $p = .221$, indicating that MOAS scores were not significantly different between pretest and posttest. The interaction effect between time*group was not significant $F(1, 34) = 0.88$, $p = .356$, indicating that MOAS scores were not significantly different by the combination of group and time. Table 4 presents the ANOVA results. Table 5 presents means and standard deviations for each factor level combination and row and column totals.

Table 4

2 x 2 ANOVA for MOAS Scores by Group and Time

Source	*df*	*SS*	*MS*	*F*	*P*	η_p^2
Between-Subjects						
Group	1	22.22	22.22	0.71	.406	0.02
Residuals	34	1069.22	31.45			
Within-Subjects						
Time	1	32.00	32.00	1.56	.221	0.04
Time*Group	1	18.00	18.00	0.88	.356	0.03
Residuals	34	699.00	20.56			

Note. *df* – degrees of freedom; *SS* – sum of squares; *MS* – mean sum of squares, *F* – test statistic for ANOVA; *p* – level of significance, partial η^2 – effect size.

Table 5

Means and Standard Deviations for MOAS Scores

	MOAS (Pretest)	MOAS (Posttest)	Row Average
Group	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)
Mindfulness Program	3.44 (5.26)	3.11 (5.80)	3.28 (5.46)
Control	3.33 (6.36)	1.00 (1.50)	2.17 (4.71)
Column Average	3.39 (5.75)	2.06 (4.31)	2.72 (5.09)

Note. MOAS – Modified Overt Aggression Scale; *M* - mean; *SD* - standard deviation; Higher scores on the MOAS reflect higher levels of aggression. There were no statistically significant differences among the means.

An ANCOVA was also conducted to examine for differences in MOAS scores between pretest and posttest, while controlling for days missed. Missed days for the control group reflect days missed with ongoing/regular daily classes. The findings of the ANCOVA were not significant. The interaction term for time*days missed was not statistically significant ($F(1, 34) = 0.64$, $p = .431$, partial $\eta^2 = .018$), suggesting that time of assessment was not a significantly affecting the relationship between the treatment and MOAS scores. Table 6 presents the results of the ANCOVA.

Table 6

ANCOVA for MOAS Pretest and Posttest Scores While Controlling for Days Missed

Term	*F*	Numerator *df*	Denominator *df*	*p*	*partial* η^2
Time	0.82	1	34	.371	.024
Time*Days Missed	0.64	1	34	.431	0.18

Note. *F* – test statistic for ANOVA; *df* – degrees of freedom, *p* – level of significance, partial η^2 – effect size.

RQ3: What is the effect of training adults with mild intellectual disabilities in MBSR techniques on mindfulness as measured by the CAMM?

$H_0$3: There will be an increase in mindfulness as measured by the CAMM on adults with intellectual disabilities.

H_a3: There will not an increase in mindfulness as measured by the CAMM on adults with intellectual disabilities.

RQ4: What is the effect of time of assessment (preintervention with MBSR techniques and postintervention with MBSR techniques) on mindfulness in adults with mild intellectual disabilities?

$H_0$4: There will be an increase in mindfulness (preintervention with MBSR techniques and postintervention with MBSR techniques) in adults with intellectual disabilities.

H_a4: There will not be an increase in mindfulness (preintervention with MBSR techniques and postintervention with MBSR techniques) in adults with intellectual disabilities.

2 x 2 ANOVA**.** To address research question three and four, a 2 x 2 ANOVA was conducted to examine for differences in CAMM scores between pretest and posttest, and by group. The between-subjects effect for group was not significant $F(1, 34) = 16.04$, $p < .001$, indicating that CAMM scores were significantly different between the Mindfulness Program group and control group. The Mindfulness Program group ($M = 17.56$) had significantly higher scores than the control group ($M = 13.47$). The within-subjects effect for time was significant, $F(1, 34) = 4.99$, $p = .032$, indicating that CAMM scores were significantly different between pretest and posttest. The posttest scores ($M = 15.94$) were significantly higher than the pretest scores ($M = 15.08$). The interaction effect

between time*group was not significant $F(1, 34) = 1.17$, $p = .288$, indicating that CAMM scores were not significantly different by the combination of group and time. Table 7 presents the ANOVA results. Table 8 presents means and standard deviations for each factor level combination and row and column totals.

Table 7

2 x 2 ANOVA for CAMM Scores by Group and Time

Source	*df*	*SS*	*MS*	*F*	*p*	η_p^2
Between-Subjects						
Group	1	300.12	300.12	16.04	< .001	0.32
Residuals	34	636.36	18.72			
Within-Subjects						
Time	1	13.35	13.35	4.99	.032	0.13
Time*Group	1	3.12	3.12	1.17	.288	0.03
Residuals	34	91.03	2.68			

Note. *df* – degrees of freedom; *SS* – sum of squares; *MS* – mean sum of squares, *F* – test statistic for ANOVA; *p* – level of significance, partial η^2 – effect size.

Table 8

Means and Standard Deviations for CAMM Scores

	CAMM (Pretest)	CAMM (Posttest)	Row Average
Group	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)
Mindfulness Program	17.33 (3.83)	17.78 (2.67)	17.56 (3.26)
Control	12.83 (3.59)	14.11 (2.85)	13.47 (3.26)
Column Average	15.08 (4.31)	15.94 (3.29)	15.51 (3.83)

Note. CAMM – Child and Adolescent Mindfulness Measure; *M* - mean; *SD* - standard deviation; Higher scores on the CAMM reflect higher levels of mindfulness. There were no statistically significant differences among the means.

2 x 2 ANCOVA. An ANCOVA was also conducted to examine for differences in CAMM scores between pretest and posttest, while controlling for days missed. The findings of the ANCOVA were not significant. The interaction term for time*days

missed was not statistically significant ($F(1, 34) = 0.34$, $p = .567$, partial $\eta^2 = .010$), suggesting that time of assessment was not significantly affecting the relationship between the treatment and CAMM scores. Table 9 presents the results of the ANCOVA.

Table 9

ANCOVA for CAMM Pretest and Posttest Scores While Controlling for Days Missed

Term	*F*	Numerator *df*	Denominator *df*	*p*	*partial* η^2
Time	3.56	1	34	.068	.095
Time*Days Missed	0.34	1	34	.567	.010

Note. *F* – test statistic for ANOVA; *df* – degrees of freedom, *p* – level of significance, partial η^2 – effect size.

Summary and Transition

In summary, I had hypothesized that there would be a statistical significant reduction in aggressive behavior with those diagnosed with intellectual disabilities after participating in an eight week MBSR/mindfulness program at a day program facility. The findings for research question one and two indicated no differences in MOAS scores by time or group. The findings for research question three and four indicated significant differences in CAMM scores by time and group. In chapter five, I will interpret the findings and make recommendations for further research.

Chapter 5: Discussion, Conclusion, and Recommendations

Discussion

The purpose of this study was to determine the effects of introducing an MBSR program to reduce aggression on adults diagnosed with intellectual disabilities. Adults with intellectual disabilities exhibit challenging behaviors on a regular basis such as physical aggression, verbal aggression, and self-injurious behaviors (Allen, 2000; Brosnan & Healy, 2011). The study was conducted to help practitioners, agencies, and individuals identify additional coping mechanisms when dealing with aggression and associated challenging behavior. There are various treatment methods, such as CBT and mindfulness that have proven successful in decreasing challenging behaviors but little research on the use of mindfulness on aggression in adults with intellectual disabilities. The theoretical framework for this study was a mindfulness program created by John Kabat-Zinn; in this study, an 8-week mindfulness program was introduced into a day program facility to help reduce aggression. Information was sought to help improve the quality of life for individuals with intellectual disabilities and teach effective coping strategies to individuals who may exhibit challenging behaviors.

Four hypotheses were tested on MOAS scores, attendance, and CAMM scores to determine whether there were significant differences between pretest and posttest scores. Pretest MOAS scores were collected to determine the level of severity of various aggressions compared to posttest MOAS scores; there were no significant differences. However, there was an increase in mindfulness among participants, as measured by the

CAMM. Control group participants continued with normal activities and did not receive the mindfulness training; no significant differences were observed for the control group.

Interpretation of Findings

Findings of the present study showed no significant difference in terms of aggression between pretest and posttest administration of the MOAS and CAMM for either experimental or control groups. RQ1 used ANOVA to examine whether there was a significant difference between pretest and posttest MOAS groups. Results showed that there was no significant difference, indicating there was not a reduction in aggression among experimental participants as a result of the mindfulness intervention. Mindfulness training yielded no reduction in aggressive behavior. There were, however, statistical differences between the means of CAMM pretest and posttest scores, suggesting that participants became more mindful of their aggression compared to when they first started the mindfulness program. Prior to the implementation of the research, participants were not aware of what mindfulness was, and CAMM score changes indicated that they came to understand the concept of mindfulness, even though this did not yield measurable changes in their behavioral outcomes.

The finding of no reduction in aggression after the mindfulness intervention does not align with previous research. Studies have report improvements in behavior after the implementation of a MBSR. For instance, Fix and Fix (2013) found that aggression reduced among individuals with various disabilities with physically aggressive behaviors after the implementation of a mindfulness MBSR program. Additionally, Idusohan-Moizar, Sawicka, and Albany (2015) said that a mindfulness-based cognitive therapy

program for adults with intellectual disabilities led to reduced symptoms of depression and anxiety. Hwang and Kearney (2013) concluded that mindfulness training helped reduce negative behavior. Mindfulness has not only been used as an approach to reduce psychological difficulties, but also has also shown potential for enhancing quality of life for individuals with intellectual disabilities (Hwang & Kearney, 2013).

RQ2 was tested using an ANCOVA to examine for differences between pretest and posttest MOAS scores while controlling for days missed. Even when controlling for days missed, there were no significant differences in terms of the measurement of aggressive behaviors as a result of the mindfulness intervention.

RQ3 was analyzed using a 2 x 2 ANOVA to examine for differences between pretest and posttest CAMM scores by group. The results indicated that there was a significant difference in scores. This finding indicates that there was a true difference in terms of mindfulness among participants compared to when they first started the 8-week mindfulness program. Therefore, the mindfulness intervention yielded an increased understanding of mindfulness among participants. This result indicates that teaching mindfulness did have an effect on participants in that they became aware of mindfulness practices.

This finding regarding increased mindfulness supports previous research. For example, Greco, Baer, and Smith (2011) examined the implementation of the CAMM on children and mindfulness and concluded that the CAMM is a developmentally appropriate tool that can be used to measure mindfulness in children. Although participants in the present study were not children, the CAMM is an appropriate tool

based on the participants' limited cognitive abilities and suggests the opportunity for developing an understanding of mindfulness among individuals with intellectual disabilities. The teaching of mindfulness, along with mood charts, visualizations, modeling, and expressive exercises can create calmness and help manage symptoms of stress, depression, and aggression (Robertson, 2011).

An ANCOVA analysis of RQ4 indicated that controlling for days of participation in the mindfulness training did not yield significant differences in time. This finding indicates that although some participants were not able to participate in all 8 weeks of mindfulness training, controlling for days missed had no significant effect on CAMM scores, and participants were more mindful than they were prior to starting the program regardless of their attendance in the program.

The Lack of significant findings for all research questions may be attributable to four study limitations. First, the study did not control for psychotropic medication in data collection as it was not part of the study; second, there were study limitations to the overall approach of the mindfulness program used assessed in the study; third, there may be inherent study limitations in the instrument used to measure aggression in this study; and fourth, such as with the CAMM and MOAS, small sample size may have limited the power of the study to detect differences. Overall, 45% of individuals with intellectual disabilities are on psychotropic medication to address aggression and other disorders (Deb, Sohanpal, Soni, Lenotre, & Unwin, 2007). The use of psychotropic medication was not recorded and it is unknown whether participants were on psychotropic medication for aggression and anxiety. Psychotropic medication may have been a contributing factor to

the lower frequency of aggression recorded with some participants as some psychotropic medication will reduce aggression and should be controlled for in future studies.

The mindfulness instructors who conducted the MBR program, although trained in psychology and behavioral management and qualified to work with adults with special needs, were not certified to teach mindfulness or MBSR and had not previously led a mindfulness-based intervention. Additionally, the training of individuals with special needs requires more attention and detail than teaching individuals without special needs. However, the application of mindfulness in special needs individuals can have a calming effect, improve coping skills, and decrease levels of anxiety (Magaldi & Park-Taylor, 2016). Future research should ensure that instructors of mindfulness-based programs are both adequately trained in terms of teaching mindfulness and working with adults with special needs.

Third, findings of non-significance may be attributable in part to the instrument used to measure aggression. The instrument was modified to fit the needs of the research, such as capturing the frequency of each response. This allowed for accurate documentation of the response. Although the instrument was effective in accurately recording the frequency of behavior and a reliable source of documenting behavior within the population (Cohen, Tsiouris, Flory, Kim, Freedland, Heaney, & Brown, 2010), it did not allow for documenting some common aggressive behaviors, such as biting. The instrument directs the rater to document the topographies of the responses listed in each category, and biting was not listed as a response. Therefore, future researchers may consider modification of the instrument to include other problematic behaviors, including

biting. As indicated by Cohen et al. (2010), it is also possible to examine how well ratings correlate with other rating scales.

Finally, because this was a secondary analysis of an existing program at an adult care facility, sample size was limited based on center and program characteristics. Only 36 participants completed the program. Small sample size limited the study's ability to detect significant results.

It may be that the study design was sufficient and that mindfulness is not an effective intervention for aggression in adults with disabilities. Mindfulness has been shown to reduce aggression in children (Greco et al., 2011). Because of the limited cognitive abilities of some adults with intellectual disabilities, mindfulness may be an effective intervention for reducing aggression in adults with intellectual disabilities as well. However, results of this study indicate that the ability of mindfulness to reduce aggression in adults with intellectual disabilities remains inconclusive and warrants further investigation.

Limitations of the Study

Sample size is a limitation that may have affected study results, and may be a factor in the non-significant results. There were 36 participants in the study and, as such, a small sample size may prevent the findings from being generalized to other populations (Faber & Fonseca, 2014). A larger sample size may have provided increased statistical certainty (Faber & Fonseca, 2014). Additionally, training sessions were conducted once a week, which may have influenced the results. Weekly 30-minute sessions may not enough time to teach individuals with intellectual disabilities mindfulness techniques to

effectively reduce aggression. Further studies should consider increasing dose (longer time per each session), frequency (more sessions per week), and duration (longer period of intervention), to determine whether additional training yields both increased understanding of mindfulness and a significant outcome in the reduction of anger.

The program setting was another limitation to the study. Participants practiced mindfulness in the gymnastic area, and when this area was not available, mindfulness was practiced in a classroom setting, where students may have been distracted by announcements and other noises. Mindfulness requires concentration and the ability to focus on one's thoughts and attention, and teaching mindfulness in an area with noise and distraction to participants' attention spans and concentration levels may have led to the ineffectiveness of the program and non-significant results.

Recommendations for Further Research

It is recommended that future researchers use a larger sample size to improve ability to detect significant differences, relationships, and interactions (Bartlett, Kotrlik, & Higgins, 2001). It is also recommended that future researchers control for psychotropic medications. Additionally, future researchers should consider programmatic variables, including having trained and certified MBSR instructors and offering MBSR training in a dedicated space, free of external distractions. As well, dosing should be considered, with both more frequent duration (i.e., multiple times per week) and a longer duration. Another recommendation is the use of a longitudinal study designed to study the long-term benefits of mindfulness, training, and practice using multiple data collection points over time. It is also important to consider a more sensitive measure of

aggression, and should also investigate the impact of mindfulness on anxiety and depression among adults with intellectual disabilities, as they are more sensitive to change.

Implications for Practice

The results of this study will inform both clinicians and human service administrators about the use of mindfulness in educational programs for adults with intellectual disabilities. Although there were no significant difference in this study, the research indicates that MBSR is a program which is beneficial and may serve as an additional coping mechanism in dealing with aggression in adults with intellectual disabilities (Bazzano, Wolfe, Zylowska, Wang, Schuster, Barret, & Lehrer, 2015; Singh et al., 2012). The present study revealed no significant differences with MBSR and the reduction of aggression. However, MBSR is an alternative and beneficial approach that can be used in conjunction with psychotropic medication to help reduce anxiety and aggression. The literature revealed a positive outcome with the use of mindfulness to reduce aggression in adults with intellectual disabilities (Idusohan-Moizer et al., 2015; Neece, 2013; Singh et al., 2003; Singh et al., 2011a; Fix & Fix, 2013). There were, however, statistical differences in the means of the CAMM pretest and posttest scores, suggesting that participants became more mindful compared to when they first started the mindfulness program.

Conclusion

In conclusion, the purpose of this study was to investigate the impact of a MBSR training program on aggression and mindfulness in adults with intellectual disabilities.

Results indicated that the MBSR program increased mindfulness in participants, but had no effects for reducing aggressive behavior as measured. Future research should investigate the potential for MBRS and other mindfulness-based training programs to support behavioral improvements among adults with intellectual disabilities.

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Appendix A: Modified Overt Aggression Scale

THE MODIFIED OVERT AGGRESSION SCALE (MOAS)
Participant Number:_____
Rater: _____ Date:_____

Instructions
Rate the individual's aggressive behavior over the past week. Select as many items as are appropriate. Document the number of times the individual as engaged in the specific behavior.

Scoring
1. Add items in each category
2. In scoring summary, multiply sum by weight and add weighed sums for total weighted score. Use this score to track changes in level of aggression over time.

Verbal aggression

Score	Frequency	
_____ 0	_____	No verbal aggression
_____ 1	_____	Shouts angrily, curses mildly, or makes personal insults
_____ 2	_____	Curses viciously, is severely insulting, has temper outbursts
_____ 3	_____	impulsively threatens violence toward others or self
_____ 4	_____	Threatens violence towards others or self repeatedly or deliberately

Aggression against property

Score	Frequency	
_____ 0	_____	No aggression against property
_____ 1	_____	Slams door, rips clothing, urinates on floor
_____ 2	_____	Throws objects down, kicks furniture, defaces walls
_____ 3	_____	Breaks objects, smashes windows
_____ 4	_____	Sets fires, throws objects dangerously

Autoaggression

Score	Frequency	
_____ 0	_____	No autoaggression
_____ 1	_____	Picks or scratches skin, pulls hair out, hits self (without injury)
_____ 2	_____	Bangs head, hits fists into walls, throws self onto floor
_____ 3	_____	inflicts minor cuts, bruises, burns, or welts on self
_____ 4	_____	inflicts major injury on self or makes a suicide attempt

Physical Aggression

Score	Frequency	
_____ 0	_____	No physical aggression
_____ 1	_____	Makes menacing gestures, swings at people, grabs at clothing
_____ 2	_____	Strikes, pushes, scratches, pulls hair of others (without injury)
_____ 3	_____	Attacks others, causing mild injury (bruises, sprain, welts, etc)
_____ 4	_____	Attacks others, causing serious injury

CATEGORY	SUM SCORE	WEIGHTS	WEIGHTED SUM	FREQUENCY
Verbal aggression		X1		
Aggression against Property		X2		
Autoaggression		X3		
Physical Aggression		X4		
Total Weighted Score				

Appendix B: Soles of the Feet

Soles of the Feet training

Skill
Controlling the urge to be physically or verbally aggressive

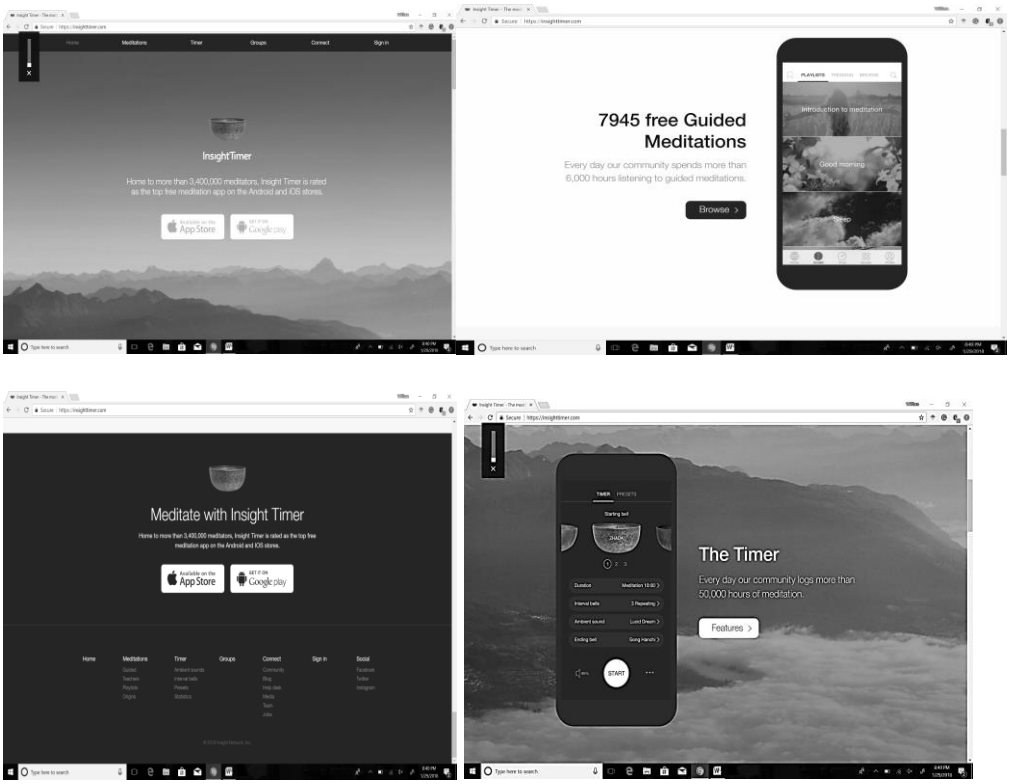
Rationale

When an incident occurs, or a situation arises that typically makes you angry and you feel like either verbally threatening or hitting someone, it is important to control these feelings. We try not to threaten or hurt people when we disagree with them. There is a simple way of quickly calming yourself

Steps of the Skill

1. If you are standing, stand in a natural rather than an aggressive posture, with the soles of your
feet flat on the floor
2. If you are sitting, sit comfortably with the soles of your feet flat on the floor
3. Breathe naturally, and do nothing
4. Cast your mind back to an incident that made you very angry. Stay with the anger
5. You are feeling angry, and angry thoughts are flowing through your mind. Let them flow
naturally, without restriction. Stay with the anger. Your body may show signs of anger (e.g., rapid breathing)
6. Now, shift all your attention to the soles of your feet
7. Slowly, move your toes, feel your shoes covering your feet, feel the texture of your socks or
hose, the curve of your arch, and the heels of your feet against the back of your shoes. If you do not have shoes on, feel the floor or carpet with the soles of your feet
8. Keep breathing naturally and focus on the soles of your feet until you feel calm
9. Practice this mindfulness exercise until you can use it wherever you are and whenever an
incident occurs that may lead to you being verbally or physically aggressive
10. Remember that once you are calm, you can walk away from the incident or situation with a
smile on your face because you controlled your anger. Alternatively, if you need to, you can respond to the incident or situation with a calm and clear mind without verbal threats or

Appendix C: Insight Timer Application



Insight Timer can be downloaded on playstore/google play and through apple store. Various guided meditations are available in every category, such as sleep, meditations for children, and stress.

Appendix D: CAMM

Child and Adolescent Mindfulness Measure (CAMM)

We want to know more about what you think, how you feel, and what you do. **Read** each sentence. Then, circle the number that tells **how often each sentence is true for you**.

	Never True	Rarely True	Some-times True	Often True	Always True
1. I get upset with myself for having feelings that don't make sense.	0	1	2	3	4
2. At school, I walk from class to class without noticing what I'm doing.	0	1	2	3	4
3. I keep myself busy so I don't notice my thoughts or feelings.	0	1	2	3	4
4. I tell myself that I shouldn't feel the way I'm feeling.	0	1	2	3	4
5. I push away thoughts that I don't like.	0	1	2	3	4
6. It's hard for me to pay attention to only one thing at a time.	0	1	2	3	4
7. I get upset with myself for having certain thoughts.	0	1	2	3	4
8. I think about things that have happened in the past instead of thinking about things that are happening right now.	0	1	2	3	4
9. I think that some of my feelings are bad and that I shouldn't have them.	0	1	2	3	4
10. I stop myself from having feelings that I don't like.	0	1	2	3	4

Appendix E: Recording Sheet

Participant Number: _____

Age: _____ Gender (circle one): Male Female

Ethnicity:_____

SCORES

CAMM (Pre-Intervention):_____

CAMM (Post-Intervention):_____

MOAS (Pre-Intervention):_____

MOAS (Post Intervention):_____

ATTENDANCE

Days Present: _____ Days Missed:_____