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**Effects of Aromatherapy on Academic Success, Perceived Stress, and Coping Skills
of Graduate Students**

By

Lakisha S. Witter

**This Dissertation is Submitted in Partial Fulfillment
of the Requirements for
the Educational Doctorate Degree
in Educational Leadership**

Minnesota State University, Mankato

Mankato, Minnesota

November 6, 2020

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Lakisha Witter

This dissertation has been approved by the following members of the examining committee:

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Abstract

This quasi-experimental study will explore whether the use of aromatherapy increases students' academic success and coping skills and decreases the level of perceived stress in graduate college students.

Acknowledgements

I would like to dedicate this to my family as a reminder that within us lies a strength and guiding light that will help us accomplish anything we put our minds to. To Chrystal Woodall, thank you for your support and belief in me for the last 17 years, your strength and life has been the needed support in the times I wanted to quit. To Dr. Richard Hill, thank you for opening my eyes, to see that within me lays something far greater than what I could imagine. Finally, to Dr. Jason Kaufman, thank you for being a pattern for me to follow of scholarly excellence in higher education that has guided and developed me on my journey, your support both as an advisor and a friend will always serve as my life reminder to be and do well.

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Chapter I

Introduction

Background of the Problem

Special education history. Our nation's current special education policies that were “intended to ensure the right to education for those who would otherwise be excluded from schooling, has paradoxically created problems of inequality within education” (Florian, 2014, p. 9). Furthermore, the passing of the Education of All Handicapped Children Act of 1975 revealed: "First, the number of students identified with learning disabilities grew much more quickly and reached much higher levels than expected. Second, the percentages of black and other racial minority students who were found eligible for special education services were much higher than the percentages of racial minorities in the U.S. population" (Brown-Chidsey, 2007, p. 40). Within special education, the overrepresentation of minority students that are misidentified (Ysseldyke, Algozzine, Richey, & Graden, 1982) has been an ongoing problem that still remains a topic of discussion in special education for an educational approach that work for all students, not just students with disabilities but also college students.

Theoretical approaches. The notion of the researchers examined various conceptual models for educating students with disabilities (Obiakor & Bakken, 2011, p. 158). These conceptual models: (a) psychodynamic, (b) psychoeducational, (c) ecological, (d) humanistic, (e) behavioral, (f) cognitive-behavioral and (g) biological throughout history have within themselves solely acted in isolation from one another. Each of these approaches in isolation suggests that human behavior is shaped by an externally or internally factors whether it be genetical, ecological, cognitively, societal or

environmental. However, these foundational thoughts of education have not considered the impact that stress can have on college students' academic success and their ability to cope with perceived stress. The application of the various theories all proved insufficient in one way or another to improve educational outcomes for students.

Stress among college students in education. The American Association of Community Colleges reported that 43% of the 11.5million students enrolled in college were vulnerable to stress (Ahern, & Norris, 2011). Due to the life changes, course load, time management and their perception and attitude about academic success (Segrin, 1999). Researchers also shows that stress is a major issue for college students who often face academic, financial, personal and social pressures (Segrin, 1999). As such, college settings provide opportunities for Adverse Childhood Experience survivors to increase their adaptive functioning (Khrapatina & Berman, 2017, p. 276). College students are “immersed in a community of peers who might encourage the expansion of adaptive resiliency-building behaviors or increased engagement in health risk behaviors” (Khrapatina & Berman, 2017, p. 276).Furthermore, research shows that “test anxiety and stress usually decrease performance on a test or quiz and thereby undermine academic performance” (Mccaffrey,Thomas & Kinzelman, 2009, p. 88) thus causing a need for more effective academic and holistic interventions for college students to reduce stress and increase academic performance.

Aromatherapy effects on human behavior. Previous research suggest that essential oil is promotes sleeps (Wolfe & Herzberg, 1996); mood and alertness (Diego, Jones, Field, Hernandez-Reif, Schanberg, Kuhn, & Galamaga (1998). Motomura, Sakurai, and Yotsuya (2001) measured the physiological and self-reported stress with a

stressful stimulation in patients with high blood pressure and found that aromatherapy can be used to treat anxiety and stress. Further research by Burnett, Solterbeck, & Strapp (2004) found that different scents affect mood. Furthermore, research supports that aromatherapy can reduce perceived level of anxiety and stress (Ali, Al-Wabel, & Shams,(2015); Soto-Vásquez, & Alvarado-García, (2017).

As of today, aromatherapy is growing in popularity as an alternative treatment for anxiety and stress (Marti & Hine, 1997). As the most common use of aromatherapy is for relaxation (Sanderson & Ruddle, 1992) it seems likely that college students attempting to reduce stress may practice aromatherapy. Research shows that stress is a major issue for college students who often face academic, financial, personal and social pressures (Segrin, 1999).

Purpose Statement

This study will employ a quasi-experimental design complemented by behavior rating scales, and brief series of open-ended questions. It is hypothesized that the use of aromatherapy in the college course will increase student's academic success and decrease perceived levels of stress in college-level course. The main research questions for this present study are: 1) How does the utilization of aromatherapy influences student's perception of stress? 2) What impact does the aromatherapy has on students coping skill?

Hypotheses

This study will employ a quasi-experimental design to explore whether the use of aromatherapy increases student academic success and decreases perceived stress in college students at the community college level. Specifically, three hypotheses will be test:

Hypothesis 1. It is hypothesized that use of aromatherapy will improve academic success among community college students as measured by final course grade.

Hypothesis 2. It is hypothesized that use of aromatherapy will decrease perceived stress among community college students as measured by the Perceived Stress Scale.

Hypothesis 3. It is hypothesized that use of aromatherapy will promote the use of more adaptive coping mechanisms among community college students as measured by the Brief COPE Inventory.

Significance of the Research

The United States past instructional models and practices have further “ have probably been doing more harm than good in that they have resulted in disability labels and in that they have grouped children homogeneously in school on the basis of these labels. ” (Dunn, 1968). special education, psychological science approaches or stress amongst colleges students; however, it will connect the gaps between each domain that have act in isolation from one another in hopes to provide a low-cost alternative intervention for college students success

Delimitations and Limitations

The findings of the present study are limited in their generalizability to community college students of at least 18 years of age studying at a institutions in the Upper Midwest. Further research will be necessary to determine whether community college students in other regions of the country or studying at other types of institutions respond differently to aromatherapy. Due to the relatively small sample size, the present

study is similarly limited in its potential to shed light on the potentially differential effect of aromatherapy across various student demographics.

Definition of Key Terms

AethereoStick

For the purpose of this study, AethereoSticks are prefilled .5 ml plant-based concentrated essential oil sticks (Plant Extracts International, 2010): *Calm* (an essential oil blend of blue cypress, frankincense, lavender, and Melaleuca species), *Citrus Melablend* (an essential oil blend of citrus and Melaleuca species) and *Northwoods Blend* (an essential oil blend of black spruce, balsam fir, vetiver and white cypress) will be used in this study.

Adverse Childhood Experience

Adverse childhood experience (ACE) is defined as “acts of physical, emotional, and sexual abuse, neglect by caretakers, and family disruption in the years prior to turning 18” (Khrapatina,& Berman, 2017, p. 275) that can predispose individuals to stress and influence one perception of stress.

Aromatherapy

For the purposes of this study, this term is defined “as the outcome when use of essential oils inhalation and application extracted from flowers, trees, shrubs and plants (Herz,2009; Sheppard-Hanger, & Hanger, 2015).

Individual Education Plan

This term is defined as a legally mandated plan created by the educational instruction that address the institution plan to educate the individual with a disability ages Pre-K through ages 22.

Individual with Disabilities

This term is defined as an individual who have an impairment mentally, physical, emotional or cognitive impairment that limits his or her ability to participate in daily life function.

Stress

This term is defined “as the outcome when “an individual perceives that environmental demands tax or exceed his or her adaptive capacity” (Cohen, Janicki-Deverts, & Miller,2007, p. 1685).

Positive Stress

This term is defined as the experience of a mild or moderate psychological and/or physiological response in the body caused by the presence of an emotionally positive event in the environment.

Tolerable Stress

This term is defined as the experience of a more significant psychological and/or physiological response in the body caused by the presence of events in the environment.

Toxic Stress

Toxic stress is defined as a maladaptive response “characterized by prolonged or frequent activation of the stress response that leads to a dysregulation of the neuroendocrine-immune circuitry, which produces altered levels of important hormones and neurotransmitters and ultimately changes in brain architecture and multiple organ systems” (Bucci & Harris, 2016, p. 409).

Chapter II

Review of the Literature

Special Education History

Since 1977, in the United States there has been a notable increase in the number of students receiving special education services. Based on the United States Department of Education's National Center for Education Statistics 2018 Data report, in 1977 there were 3,694,000 children 3 to 21 years old being served under the Individual with Disabilities Education Act, Part B. Of these 3,694,000 children, 283,000 children were classified with emotional disturbance, 88,000 hearing impairment, 961,000 intellectual disabilities, 87,000 orthopedic impairment, 141,000 other health impairment, 796,000 specific learning disabilities, 1,302,000 speech or language impairment, and 38,000 visual impairment. In 2015, there was a 56 percent increase from 1977 to 6,555,000 children 3 to 21 years old being served under the Individual with Disabilities Education Act, Part B. Of these 6,555,000 students with disabilities, 76,000 children were classified with autism, 1,000 deaf-blindness, 419,000 developmental delay, 349,000 emotional disturbance, 76,000 hearing impairment, 423,000 intellectual disabilities, multiple disabilities 132,000, 52,000 other health impairment, 2,278,000 specific learning disabilities, 26,000 traumatic brain injury, and 28,000 visual impairment.

Amidst all of this classification of children into special-education services, the history of special education in the United States reflects the nation's struggles and best intentions to uphold its constitutional belief that all individuals are created equally. The societal perception and treatment of students with disabilities in the 1700s speak to the nation's social perception of the rights and moral treatment of individuals with

disabilities. The societal landscape during the 1700s categorized individuals with disabilities as “insane, idiots, deaf-mutes, blind persons, homeless children, prisoners, paupers, and the indigent” (Ashbaker, 2011, p. 22). Often times these students were institutionalized, isolated from society and left uneducated (Ashbaker, 2011; Martin, Martin & Terman, 1996). Prior to the 1700s, students with disabilities were outcast (Yell, Rogers, & Rogers, 1998) due to the societal perception and ecclesiastical belief that “disabilities were inflicted by God or the devil and could be cured only by divine intervention” (Winzer, 2014, p. 24). In addition to this belief, societal perception at this time deemed that students with disabilities were incapable of achieving academic and social success thus special education programming focused on manually training and not academics. Instead, such students were directed toward the vocational education of the time.

Manual training was a “way of teaching children industriousness, and clearing up their character problems . . . the appeal of this training was the belief that it would attract children to school, especially poor children, so their morals could be reshaped . . . Manual training would teach children to be industrious and prevent the idleness that accounted for the increasing crime rate . . . it could teach self-discipline and will power” (Wright & Wright, 2006, p. 7).

Compulsory education. The right to an education and school admittance of students with disabilities was a matter of states as deemed in 1791 by the establishment of the 10th Amendment of the U.S. Constitution (Yell, Rogers, & Rogers, 1998). There are numerous reported cases at the state level where students with disabilities were not able to attend school. In 1840, Rhode Island became the first state to pass compulsory

education. The compulsory education law set by Rhode Island set mandatory parameters in respects to age, attendance, exemption, and admission for students with disabilities thus allowing students with disabilities seven to sixteen to attend public school (Yell, Rogers, & Rogers, 1998). However, with the passing of mandatory compulsory education in all states by 1912, the lack of implementation and governance still allowed students with disabilities to be excluded from receiving equality in services and funding after 1912 (Yell, Rogers, & Rogers, 1998). For example, in the case of *Beattie v. Board of Education* (1919), the Wisconsin Supreme Court ruled that school officials could exclude individuals with disabilities who had been attending public school until the fifth grade (Yell, Rogers, & Rogers, 1998). Furthermore, the ruling in 1958 from the Supreme Court of Illinois, in *Department of Public Welfare v. Haas*, “held that the state's existing compulsory attendance legislation did not require the state to provide a free public education for the feeble minded" or children who were "mentally deficient" and who, because of their limited intelligence, were unable to reap the benefits of a good education” (Yell, Rogers, & Rogers, 1998, p. 220).

The persistent discrimination seen in rulings at the state level brewed a deep frustration amongst the parents of the disabled. This frustration that led them to take action with the witnessing the first parent-led Cuyahoga County Ohio Council for the Retarded Child in 1933. Through their advocacy efforts, it was established in Ohio that special classes for their children were allowed; however, the parents incur and had to pay the cost to educate their children. The movement of parent advocacy built an alliance with other state organizations that formed the National Association for Retarded Citizens (NARC), organized in Minneapolis, Minnesota in 1950. NARC brought “forty-two

parents and concerned individuals from 13 local and state organizations met to establish what has become a powerful and significant organization of parents, families, and other persons with an interest in persons with mental retardation. NARC's mission is to provide information, monitor the quality of service given individuals with mental retardation, and to serve as an advocate for rights and interests of individuals with mental retardation” (Yell, Rogers, & Rogers, 1998, p. 222).

Supreme Court and special education. The concept of educating children with disabilities in regular public schools is an extension of the civil rights movement, which was strongly influenced by social developments and court decisions. The Supreme Court addressed the inequality in educational rights for the lens of race with the ruling of *Brown v. the Board of Education* of 1954. The ruling was an attempt to dismantle the inequality that separate educational facilities are inherently unequal (347 U.S. 483 1954). This ruling declared racial segregation violates the Fourteenth Amendment to the U.S. Constitution, which guarantees all citizens equal protection of the laws (Ashbaker, 2011; Yell, Rogers, & Rogers, 1998). *Brown v. Board of Education* shaped future national and international policies regarding human rights and education. Recognizing the need for every citizen to receive an education, Chief Justice Earl Warren (Decision on *Brown v. Board of Education of Topeka*, 1954, Document 29.3.1, para. 8) wrote, Today, education is perhaps the most important function of state and local governments. Compulsory school attendance laws and the great expenditures for education both demonstrate our recognition of the importance of education to our democratic society. It is required in the performance of our most basic public responsibilities, even service in the armed forces. It is the very foundation of

good citizenship. Today it is a principal instrument in awakening the child to cultural values, in preparing him for later professional training, and in helping him to adjust normally to his environment. In these days, it is doubtful that any child may reasonably be expected to succeed in life if he is denied the opportunity of an education. Such an opportunity, where the state has undertaken to provide it, is a right that must be made available to all on equal terms.

The *Brown* case not only banned segregation in schools, but also helped pave the way for the gradual end of segregation in other aspects of American society. Following *Brown v. Board of Education* were several new cases that addressed the rights of children with disabilities to be educated in regular public schools.

Groundbreaking changes were seen for individuals with disabilities in the late 1960s with the introduction of the concept of normalization. Normalization was coined by Bengt Nirje, a Scandinavian, who believed that normalization gave individuals with disabilities the right to be included in all aspects of everyday life socially, community engagement and economically (Salkind, 2008). Normalization “also emphasized the right of individuals to have their choices and preferences considered in decision making” (Salkind, 2008, p. 668). During 1960s Congress began to take into consideration the disputation of individuals with disabilities within the workforce by the passing of the Barden-LaFollette Act (Public Law 78-113) to ensure that individuals with mental illness and retardation to receive vocational rehabilitation that protected the employment and reintegration into society (Bruyère, 2006). Since the passing of Barden-LaFollette Act, American society has advocated for the innate worth of individuals with mental illness and retardation to have the resources needed to become productive citizens in the

workforce and society. Today the United States current educational system defining of a disability as

... a natural part of the human experience and in no way diminishes the right of individuals to participate in or contribute to society. Improving educational results for children with disabilities is an essential element of our national policy of ensuring equality of opportunity, full participation, independent living, and economic self-sufficiency for individuals with disabilities. (U.S Department of Education, 2015).

Having this belief that have a disability is defined by as “(i) with mental retardation, hearing impairments (including deafness), speech or language impairments, visual impairments (including blindness), serious emotional disturbance (hereinafter referred to as emotional disturbance’), orthopedic impairments, autism, traumatic brain injury, other health impairments, or specific learning disabilities; and (ii) who, by reason thereof, needs special education and related services. (U.S Department of Education, 2015).

Subsequently, Congress become more favorable to the passing of laws to educate children with disabilities in such setting. In 1965, The Elementary and Secondary Education Act (ESEA; P.L. 89-10) allocated funding to educating children with disabilities within the public-school setting (U.S Department of Education, 2015; Yell, Rogers, & Rogers, 1998). In 1967-1968 the U.S. Office of Education reported that 60 to 80 percent of students receiving special education services were students who were from lower class social economic status, and a person of color including Afro-Americans, American Indians, Mexicans, and Puerto Rican Americans (Dunn, 1968).

In 1975, P.L. 94-142 Congress attended to more than one million children disabilities that were experiencing inequality in education by the limited access to education and the denial of appropriate education. The four purposes of P.L. 94-142 was to assure that children with disabilities received public education, their educational rights will be protected, to aides stated in providing education to children with disabilities and to assess the overall effectiveness of the states in education children with disabilities.

Additional court rulings supported the National Association for Retarded Citizens efforts for equality for students with disabilities in the *Maryland Association for Retarded Citizens v. Maryland* case in (1972) which ruled that all children with intellectual disabilities have a right for a free and appropriate education. In the case of *Mills v. Board of Education in the District of Columbia* the Court ruled that regardless of the student severity of the student's disability the school district must provide a free and appropriate education. In 1973, *LeBanks v. Spears* court ruled that students with disabilities have the right to be educated with their non-disable peers. The passing of federal laws in support of equality for students with disabilities has enabled these students a right to a public education, and the right to the necessary educational funding provided by states. Conversely, the passing of these laws in a sense has been like putting a bandage on a wound without addressing the root cause of race and the matter of developing special education problems of overrepresentation and misidentification of minority students with disabilities (Dunn, 1968).

The United States Department of Education's National Center for Education Statistics 2018 Data report shows that in 2015-2016, 34% of all students receiving special education services had specific learning disabilities, 20 percent of speech and language

impaired, and 14 percent had other health impaired and autism, intellectual disabilities, development delayed, and emotional disturbance each accounted for between 5 and 9 percent of students served under IDEA. Further analysis of these data by race shows that for the 2015-2016, children 3 to 21 years old being served under the Individual with Disabilities Education Act, Part B that 17 percent were American Indian/Alaska Native, Black (16 percent), White (14 percent), of two or more races (13 percent), Hispanic and Pacific Islander (both at 12 percent), and Asian (7 percent). Data show by disability category that for specific learning disabilities was lower among Asian students (21 percent), students of two or more races (30 percent), and White students (31 percent) than among students overall (34 percent).

It is this evident, in spite of the relevant Court rulings and Congressionally passed laws, that “the United States do not have equal opportunities to experience success in the educational system. Many of the students who have been excluded from the ‘American Dream’ are culturally, linguistically, or economically different from the majority culture [of Western European ancestry, middle income, and for whom English is their first language]” (Sarat, 2010, p. 36). Since these findings, there has been attention given to the concept of race and how it plays into our current education system injustice for minority students.

Theoretical Approaches

The need for a systematic approach to understand and educate students with disabilities came to surface in the mid-1930. However, it was not until 1950 that researchers examined various theoretical science framework of human behavior through an educational lens. It should be noted that these theories were not intended for

educational instructional practices but an approach to understand human behavior. Instead, over the course of time the elements of each major model were applied with mixed results to the school classroom.

Psychodynamic approach. During the 1930s and 1940, psychodynamic theorists claimed that an individual's mental state was caused by pathologies (Obiakor & Bakken, 2011) that displayed “disruptive symptoms to be expressions of maladaptive emotion regulation or coping mechanisms (defenses) used by the child to protect himself or herself from painful emotions” (Rice, 2014, p. 694). Psychodynamic theorists encouraged children to resolve their intrapsychic conflicts and thereby attain more optimal functioning” (Obiakor & Bakken, 2011, p. 158). Interventions based on psychodynamic theory include individual talking therapy and permissive classroom environments with highly accepting teachers (Yell et al., 2009). However, these instructional practices have shown to be ineffective because counseling intervention proved to be “among the least effective options to use if the goal is to produce reliable, meaningful changes in student behavior” (Walker, Ramsey, & Gresham, 2004, p. 159).

Psychoeducational approach. The psychoeducational approach dealt with learned behavior and was intended to promote self-regulated and adaptive behavior on the part of the individuals with whom it is used (Wood & Long, 1991) and gain insight and regulation of their behavior, “social skill autopsies” (Lavoie, 2005). Morse (2004) suggested that social interaction of key to success psychoeducation; thus, intervention such as small group and interaction with peers create a learning environment for students (Griffiths, 2006).

Ecological approach. In the early 1960s, Bronfenbrenner coined the ecological approach to explain how a child developed within their complex social systems. This approach further suggested that the “pattern of activities, roles, and interpersonal relations experienced by the developing person in a given setting with particular physical and material characteristics” (Bronfenbrenner, 1979, p. 22) influences how, when, and where individuals engage in their everyday lives (Dooley, 2018). Through the lens of this model individuals with disabilities had fewer degree of connection with environmental system that thus they must be taught cognitive control strategies to help them manage their own behaviors and competencies “by developing skills that will enable them to function more typically in a classroom situation, the most common ecology shared by children in the United States, children are believed to gain confidence as well as the ability to gain acceptance by other children, teachers, and other community members, including the child’s parents”(Obiakor & Bakken, 2011, p.15).

Humanistic approach. The humanistic approach "emphasizes the importance of the inner world of the learner and places the individual’s thought, feelings and emotions at the forefront of all human development" (Lei, 2007, p. 60). The humanistic approach to educating students focused on the belief that “abnormal behavior was suggested to be the result of pressures to conform to societal expectations that block the individual’s drive toward self-actualization” (Obiakor & Bakken, 2011 p.15). The implication of the humanistic approach within instructional practices within the classroom with focus on building positive with teacher and peers, allow the opportunities to reason and individual strength are celebrated. (Obiakor & Bakken, 2011).

Behavioral approach. The behavioral approach maintains the perspective that human behavior is a result of stimulus-response relationship. Furthermore, Watson (1913) stated that, "Psychology as a behaviorist views it is a purely objective experimental branch of natural science. Its theoretical goal is ... prediction and control" (p. 158). The approach assumes that behavior is shaped as a result of the environment and can be controlled by setting clear directions, following through on expectation behavioral principles, have firm expectations (Obiakor & Bakken, 2011). As of today, behavioral principles remain prominent in education programs today because of their effectiveness and clear ability to communicate the actions and results of an intervention to funding agencies and other stakeholders (Obiakor & Bakken, 2011, p.15).

Cognitive approach. The early behavioral approach of 1960s "focused exclusively on environmental determinants of behavior. They demonstrated that environmental factors lead to two basic forms of learning, classical conditioning and operant conditioning" (Sochting, 2014, p. 9). For example, if movements and other behaviors are learned, so must the behaviors that are thoughts be learned. Similar to the thinking found in the ecological and behavioral approaches, cognitive practitioners suggest that learned maladaptive thought patterns can be replaced with more adaptive thoughts. (Obiakor & Bakken, 2011). Cognitive behaviors procedures have appeared to have greatest efficacy in areas such as anxiety disorders and depression (Beck, 1976). Additionally, cognitive-behavioral approaches have been used to teach behavioral self-control in a variety of settings to students with Emotional Behavioral Disorder (Polsgrove & Smith, 2004).

Biological approach. The biological approach is based upon the notion that human behavior is strongly determined by our genes and our genetic inheritance and in order to explain human thought and behavior, it is necessary to understand the functions and structure of the brain and the nervous system more generally. Furthermore, any imbalance of certain chemicals in the brain may cause abnormal behavior and thought (Kalat, 2007, p.244)

Stress among College Students

Cohen (2007) defined stress as the outcome when “an individual perceives that environmental demands tax or exceed his or her adaptive capacity” (p. 1685), which builds upon the notion that the "stressor effects are assumed to occur only when both (a) the situation is appraised as threatening or otherwise demanding and(b) insufficient resources are available to cope with the situations" (Cohen, Kamarck, & Mermelstein, 1983, p. 386). In order for humans to survive, the brain and body had to come up with efficient ways of processing information, and the stress-response system is one of them” (Burke-Harris, 2016, p. 47). Furthermore, Lazarus (1990) suggested that an individual’s perception of stress is impacted by their coping mechanisms. Lazarus (1990) observed that stress is grounded in a transactional relationship between an individual and his/her environment. The essence of this theory stems from the idea that an individual’s’ perception of an event influences how he or she processes with the event that appears harmful or threatening (Lazarus, 1990). The matter of perception causes an individual to respond with what Folkman and Lazarus (1980, 1985) identified as problem-focused and emotion-focused coping. Problem-focused coping aims “at managing or altering the problem that is causing stress, whereas emotion-focused coping strategies are directed at

regulating an individual's emotional response to a problem” (McMillian & Morris, 2012, p. 645). Folkman and Lazarus (1980, 1985) demonstrated that problem-focused coping occurs when an individual “who perceives that (s)he can change the situation, whereas emotion-focused coping strategies are used when an individual perceives that nothing can be done to change potentially harmful or threatening situations” (McMillian & Morris, 2012, p. 645). If this notion holds to be true further explanation is needed to fully understand what factors can influence an individual’s perception and ability to cope with stress: positive, tolerable, and toxic.

Positive stress. Positive stress is a physiological response to a mild or moderate stressor (Bucci & Harris, 2016, p. 410) in which there is a “brief increases in heart rate and mild elevations in hormone levels” (Burke-Harris, 2016, p. 54), which occurs when the individual perceives the ability to solve and have control over the situation (Jensen, 2008). Positive stressors are experience in individual’s daily life as they experience brief physiological dysregulation by riding a roller coaster, experience the intense emotions of a playoff game or anxiety for a final exam. After these moments has passed an individual body return to homeostasis which is the process where an individual biological system’s self-regulating properties that maintain internal stabilization of physiological variables like temperature and energy (Bucci & Harris, 2016; Burke-Harris, 2016).

Tolerable stress. Tolerable stress is an adaptive response to a time-limited stressor (Bucci & Harris, 2016, p. 410). Tolerable stress causes the body to experience short-term systemic change. However, if the activation is time-limited and buffered by relationships the individual return to homeostasis. Tolerable stress is experienced in life

may occur with a short period of homelessness, immigration or a natural disaster (Bucci & Harris, 2016).

Toxic stress. Toxic stress is a maladaptive response “characterized by prolonged or frequent activation of the stress response that leads to a dysregulation of the neuroendocrine-immune circuitry, which produces altered levels of important hormones and neurotransmitters and ultimately changes in brain architecture and multiple organ systems” (Bucci & Harris, 2016, p. 409). According to Cohen (2017), “stressful events are thought to influence the pathogenesis of physical disease by causing negative affective states (e.g. feelings of anxiety and depression), which in turn exert direct effects on biological processes or behavioral patterns (p. 1685). The body response to toxic stress occurs when an individual experiences prolonged adversity, this level of stress activates “the stress-response systems can disrupt the development of brain architecture and other organ systems, and increase the risk for stress-related disease and cognitive impairment well into adult years” (Burke-Harris, 2016, p. 55).

Further research suggests that stress and adverse childhood experience (ACE) affect not only health but also the ability of adults to cope with stress (Burke-Harris, 2016). Burke-Harris (2016) expounded upon that by stating *Adverse Childhood Experience (ACE)* are “acts of physical, emotional, and sexual abuse, neglect by caretakers, and family disruption in the years prior to turning 18” (Khrapatina & Berman, 2017, p. 275) that can pre-expose individuals to stress and influence one's perception of stress.

ACE was originally coined by Felitti, Anda, Nordenberg, Williams, Spitz, Edwards & Marks (1998), who studied 17,421 participants to “address ten categories

relevant to stress in childhood: emotional, physical, sexual, physical, emotional, substance abuse, mental illness, criminal behavior, parental separation, and mother treated violently” (Burke-Harris, 2016, p. 37). They found that the participants of the original study were 70 percent of college student that were Caucasian, results showed that “the higher a person’s ACE score, the greater the risk to his or health” (Burke-Harris, 2016, p. 38) and “persons who had experienced four or more categories of childhood exposure, compared to those who had experienced none, had 4- to 12-fold increased health risks for alcoholism, drug abuse, depression, and suicide attempt; a 2- to 4-fold increase in smoking, poor self-rated health, 50 sexual intercourse partners, and sexually transmitted disease; and a 1.4- to 1.6-fold increase in physical inactivity and severe obesity” (Felitti et al., 1998, p.38). In conjunction, Burke-Harris (2016) showed that individuals with four or more ACEs are 32 times as likely to have learning or behavior problems (p.61) furthermore supporting that exposure to adversity such as abuse and neglect during child and adolescent development can result in negative behavioral and physical health outcomes due to potential long-term embedding into regulatory biological processes. However, it is important to note that the majority of these data were obtained from white participants. The additional stress caused by discrimination among other groups remains relatively unclear.

College student stress. Further research by Duncan (2000) suggested that trauma can have tangible effects on college students “including increased risk for dropping out of college, poorer grades, and poorer self-rated health, even if symptoms of maladjustment do not reach pathological levels” (Khrapatina & Berman, 2017, p. 276). Runtz (2002) conducted one of the only studies with college students that is

comparable to the research on adverse childhood experiences, assessing the impact of multiple forms of maltreatment in childhood on physical health in female college students. This study found that a history of maltreatment was related to increases in general health symptoms, as well as premenstrual and menstrual symptoms (Khrapatina & Berman, 2017, p. 277)

An individual response, whether problem-focused or emotional-focused is not deemed an innate biological or psychological response but is contributes to external factors such as the quality of support from community and friends (Daly, Jennings, Beckett, & Leashore, 1995). The idea that coping can be supported through social support was demonstrated by Cohen and Willis (1985). Their buffering hypothesis posited that “support ‘buffer’ (protects) person from the potentially pathogenic influence of stressful event” (Cohen & Willis, 1985, p.310). Cohen and Willis identified four level of support: (a) *esteem* (an individual feel accepted); (b) *emotional* (an individual has close support), (c) *informational* (an individual has support and guidance); and (d) *instrumental* (an individual has financial provision). All supports are believed to impact the way in which an individual respond to stressful events. If this holds to be true, one can hypothesize that if an individual perceives their support to be adequate then their response to stressful events will be more problem-focus whether than emotional focus. Importantly, what matters is that the individual is able to muster some mix of problem-focused and/or emotion-focused coping mechanisms that allow him or her to successfully navigate the stressful situation.

Aromatherapy Effects on Human Behavior

Aromatherapy is an approach toward coping with stress well documented into antiquity. Daring back to ancient civilization more than 6,000 years (Ali, Al-Wabel, & Shams, 2015). However, it wasn't until 1980s that aromatherapy became a serious discipline when psychoneuroimmunology took interest in the use of aromatherapy to alleviate emotional and mental distress (Butje, Repede, Elizabeth, & Shattell, 2008) through the use of essential oils extracted from flowers, trees, shrubs and plants (Herz,2009; Sheppard-Hanger, & Hanger, 2015).

Essential oils. Essential oils are believed to have molecules which exert biochemical or physiological effects of cell tissues of organism which makes essential oils highly reactive molecular components (Cristina, 2004). Scientific research has shown that aromatherapy affects human behavior by having a effect on physical, physiological and psychological responses. These molecular components are neurologically transmitted to the olfactory bulb in the brain where the olfactory receptors is combined, forming a pattern that is perceived as a distinct odor in multiple areas in the cerebral cortex and the limbic system (Butje, Repede, Elizabeth, & Shattell, 2008).Through the use of essential oils being inhale through nasal, olfactory nerves or limbic system activate the limbic system generating an effect on arousal and emotional response. Inhaled odors activate the release of neurotransmitters such as serotonin, endorphins, and norepinephrine in the hypothalamic pituitary axis and modulate neuroreceptors in the immune system, altering mood, reducing anxiety, and interrupting the stress response (Butje, Repede, Elizabeth, & Shattell, 2008).

Psychological hypothesis. Further research studies support the physiological effects of essential oils through the psychological hypothesis which suggests that effectiveness of essential oils odors works through an individual perception, belief, expectation and emotional learning (Johnson, 2011). Furthermore, the psychological hypothesis suggests “that responses to odors are learned through association with emotional experiences, and that odors consequently take on the properties of the associated emotions and exert the concordant emotional, cognitive, behavioral, and physiological effects themselves” (Herz, 2009,p.27).

Ehrlichman, Kuhl, Zhu, and Warrenburg (1997) found that an individual’s perception of a pleasant and unpleasant order effects their mood, through the molecular components of essentials oils activation of the amygdala which seats our emotions memory. This activation creates a neuroanatomical connection that form emotional memory within the brain that enable odor-evoked recall (Herz, Eliassen, Beland, & Souza, 2004). Research has shown that “odor induced emotional responses occur rapidly, with exposures of less than two minutes inducing significant mood changes” (Kadohisa,2013, p. 2) causes an “adaptive changes of physiological state including heart rate and endocrine responses” (Kadohisa, 2013, p. 2), Further research shows that positive mood is linked with improvements in cognition function therefore, mood (induced via odor pleasantness) may underpin cognitive facilitation (Johnson, 2011). Consequently it should be noted that research shows although essential oil can influences cognitive and emotion response this varies based on individual perception (Fitzgerald, Culbert, Finkelstein, Green, Johnson, & Chen, 2007), personalities and past experience with the odor that determines whether odors affect the mood of participants cause there to

be a change in the neural network in that olfactory the alertness the perception of the odors (Knasko, Gilbert, & Sabini, 1990). Under such an account one might predict that an “odor should only impact cognition when: (1) the participant is aware of the odor’s presence, and (2) the participant possesses a belief that the odor should induce specific effects” (Johnson, 2011, p. 5470).

Pharmacological hypothesis. The pharmacological hypothesis proposes “that the effects of various aromas on mood, physiology and behavior are due to the odor’s direct and intrinsic ability to interact and affect the autonomic nervous system/central nervous system and/or endocrine systems” (Herz, 2009, p. 271). In order for an “volatile compound to act pharmacologically it must enter the bloodstream by way of the nasal or lung mucosa or diffuse directly into the olfactory nerves and the limbic system of the brain. (Herz, 2009, p.271). Furthermore, the pharmacological hypothesis suggests that smelling of essential oils and correlation to an individual memory of pleasure or pain will have a effect on the body response (Fitzgerald, Culbert, Finkelstein, Green, Johnson, & Chen, 2007). According to the semantic associated with a pleasant memory, then exposure to that scent should improve mood, cognitive function, facilitate performance, and decrease anxiety (Jellinek, 1997; Johnson, 2011). Furthermore, research has shown that certain essential oils have been found to improve performance of learning and improve memory (Herz, Schankler, & Beland, 2004).

Effects of aromatherapy. Wolfe and Herzberg (1996), found that essential oil promotes sleep. Diego, Jones, Field, Hernandez-Reif, Schanberg, Kuhn, McAdam, Galamaga, and Galamaga (1998) suggested that essential oil does impacts individual mood and alertness, focus and attention. Further research by Burnett, Solterbeck, and

Strapp (2004), founded that different scents affect mood. In the study “students receiving inhaled rosemary scored significantly higher on measures of tension-anxiety and confusion-bewilderment than did those in lavender and control groups. Both rosemary and lavender were significantly associated with lower fatigue-inertia ratings” (Butje, Repede, Elizabeth, & Shattell, 2008, p. 49). Motomura, Sakurai, and Yotsuya (2001) measured the physiological and self-reported stress with a stressful stimulation in patients with high blood pressure and found that aromatherapy can be used to treat anxiety and stress. Furthermore, research supports that aromatherapy can reduce perceived level of anxiety and stress (Ali, Al-Wabel, & Shams, 2015; Soto-Vásquez, & Alvarado-García, 2017).

Research also shows that stress is a major issue for college students who often face academic, financial, personal and social pressures (Segrin, 1999). Furthermore research shows that “test anxiety and stress usually decrease performance on a test or quiz and thereby undermine academic performance” (Mccaffrey, Thomas & Kinzelman, 2009, p. 88) thus cause a need from more effective intervention among college student to reduce stress and increase academic performance. Mccaffrey, Thomas and Kinzelman (2009), showed that essential oils reduce test anxiety, increase concentration and reduce levels of stress amongst nursing colleges students. The use of aromatherapy is growing in popularity as an alternative treatment for anxiety and stress (Marti & Hine, 1998). As the most common use of aromatherapy is for relaxation (Sanderson & Ruddle, 1992) it seems likely that college students attempting to reduce stress may benefit from using aromatherapy.

Chapter III

Method

Participants

Potential participants (anticipated $n = 64$) will be recruited from two communication courses at a community college in the Upper Midwest during the spring 2020 semester. The community college is a small institution of approximately 3,000 students that offers both technical and liberal-arts coursework oriented toward a range of associate's degrees. Both courses (*Introduction to Human Communication* and *Small Group Communication*) will be taught by the same instructor. *Introduction to Communication* is an introductory survey course that introduces students to a range of fundamental topics from interpersonal communication, intercultural communication, public speaking, small group communication, media, organizational communication, and interviewing. *Small Group Communication* is intended to develop more effective communication for leaders and participants in the small group settings.

Materials

AethereoSticks. Research suggests that “diffusion and inhalation as the most efficient and economical ways to enjoy essential oils and essential blends” (Plant Extracts International. (2010).). For the present study, participants in the treatment group will use AethereoSticks, prefilled .5 ml plant-based concentrated essential oil sticks (Plant Extracts International. (2010).) that has been extracted using distillation methods. Each participant’s AethereoSticks bag will include the following scented essential oil sticks: *Calm* (an essential oil blend of blue cypress, frankincense, lavender, and Melaleuca species), *Citrus Melablend* (an essential oil blend of citrus and Melaleuca species) and

Northwoods Blend (an essential oil blend of black spruce, balsam fir, vetiver and white cypress). Participants in the control group will not be exposed to AethereoSticks. Instead, they will experience their classroom without intervention.

Course grades. Subsequent to submission of course grades by the instructor at the end of the spring 2020 semester, all participants course grades will be obtained. These grades will include overall course grade and small-group project score.

Perceived Stress Scale. The Perceived Stress Scale (Cohen, Kamarck, & Mermelstein, 1983) is the “most widely used psychological instrument for measuring the perception of stress” (Cohen & et al., 1994, p. 385). The measure is a 10-item Likert-type rating scale that measures an individual’s perception of stress and “degree to which situations in one’s life are appraised as stressful. Items were designed to tap how unpredictable, uncontrollable, and overloaded respondents find their lives. The scale also includes a number of direct queries about current levels of experienced stress” (Cohen & et al., 1994). Items are scored with the following rating scale: 0 = *never*, 1 = *almost never*, 2 = *sometimes*, 3 = *fairly often*, and 4 = *very often*. (see Appendix A).

Brief COPE Inventory. The Brief COPE Inventory (BCI; Carver, 1997) a 28-item instrument designed to assess the extent to which an individual utilizes a variety of coping mechanisms to deal with stress (see Appendix B). The BCI will be scored using Kaufman Interpretation of Brief COPE Inventory (personal communication, see Appendix C). Items will be scored with the following rating scale: Problem-focused Coping: *Active coping*: 2, 7. *Use of instrumental support*: 10, 23, *Positive reframing*: 12, 17, *Planning*: 14, 25, and *Acceptance*: 20, 24. Emotion-focused Coping: *Use of emotional support*: 5, 15, *Venting*: 9, 21, and *Humor*: 18, 28, *Religion*: 22, 27.

Maladaptive Coping: *Self-distraction*: 1, 19, *Denial*: 3, 8, *Substance Use*: 4, 11, *Behavioral disengagement*: 6, 16 and *Self-blame*: 13, 26.

Demographic survey. Participants will also be asked to respond to a survey that queries a range of demographic items (i.e., age, gender, race, employment, [full-time, part-time, or none]), as well an item intended to determine the subjective experience of utilizing the AethereoSticks among the treatment group. Participants will be asked to rate their level of agreement with the statement, “I feel that using the AethereoSticks this semester help me to manage my stress.” The item will be scored with the following rating scale: 1 = *strongly agree*, 2 = *agree*, 3 = *neutral*, 4 = *disagree*, 5 = *strongly disagree* (see Appendix D). Participants will also be asked to respond to the following open-ended question “Which AethereoStick did you use the most during this study?”

Procedures

Potential participants will be recruited from two communication courses, both taught by the same instructor, at a community college in the Upper Midwest in spring 2020 semester. The recruitment process will be conducted by the researcher in the absence of the instructor in the classroom. The researcher will explain to both classes the purpose of the study, procedure, benefits and risk of participation, statement of confidentiality, voluntary nature of study, statement of consent and address any questions prior to asking for consent to participant in this present study. Informed consent will be obtained from participants 18 years old or older prior to participating in this present study. Neither participants nor instructor will be compensated for their participation.

The researcher will administer to all participants the PSS (Cohen & et al.,1994) and Brief COPE Inventory (BCI; Carver, 1997) rating scale during pretesting and

posting. Pretesting will occur at mid-semester at the start of the small-group project. Posting testing will occur after the eight-week intervention. In addition to these measures the researcher will administer to the all participants during post testing a demographic survey (see Appendix D& E). The survey will be administered using the Desire-to-Learn (D2L) Brightspace survey tool. It is anticipated that pretesting measures will take participants ten minutes to complete, and fifteen minutes for all posttest measures. For all measures all identify information such as participants name, and Student ID number will be extracted from measures, and coded numerically to the participant signed consent form.

Prior to pretesting, the researcher will meet with the instructor to train the instructor on the reading of a script (Appendix F) and how to distribute the sticks. Subsequent to pretesting, the researcher will provide training during the scheduled course time to the course instructor and the treatment group on how to use to essential oil AethereoStick for this present study. For the intervention, participants in the treatment group will be required to participate 16 aromatherapy (three minute long) interventions administer by the instructor throughout eight weeks. During each class the instructor will instructed the participants in the treatment group to get their AethereoStick bag from the assigned location, select from their AethereoStick bag the AethereoStick the will be using for the intervention session. Next, the instructor will read assigned script provided by the researcher (see Appendix F) and model for the participants how to use the AethereoStick while holding them three inches from their nose.

The aromatherapy intervention for the treatment group will occur in mid-semester during the courses eight-week small group project. The treatment group will implement

daily aromatherapy intervention in the course in addition to the normal course activities and assignments. The control group will not be exposed to the essential oil AethereoStick and will be taught as the instructor normally would without the usage of aromatherapy. It is anticipated that the aromatherapy session will take participants three minutes to complete for each session.

Data Analysis

A series of t-tests will be conducted to determine the potential effect of the AethereoStick intervention. At pretest, control and treatment group performance in response to the Perceived Stress Scale (Cohen & et al., 1994) and the Brief COPE Inventory (BCI; Carver, 1997) will be compared via independent-samples t-test. At posttest, participant responses to these two measures as well as academic performance (overall course grade and small-group project score) and response to the survey item regarding use of the AethereoStick will be compared via independent-samples and single-sample t-tests.

Chapter IV

Results

Demographics Characteristics

The present study was designed to explore whether the use of aromatherapy would increase student academic success and decrease perceived stress in college students at the community college level. The procedure was modified due to the COVID-19 pandemic from participants from a community college to a comprehensive university, both predominantly white institutions in the Upper Midwest. Implementation of the revised procedure also included the conduction of the aromatherapy sessions via telepresence and utilized graduate students in educational leadership instead of community college students in communication courses.

Subjects instead were recruited from two graduate courses, one of which served as a control group (*Program Evaluation in Educational Leadership*), the other of which served as a treatment group (*Ethics in Leadership*). Both courses were taught by the same professor. *Program Evaluation in Educational Leadership* focused on developing skills within aspiring leaders in PK-12 and higher education to effectively and meaningfully evaluate programs with PK-12 or higher education institutions. *Ethics in Leadership* taught aspiring leaders in PK-12 and higher education to make ethical and moral decisions regarding real life dilemmas faced by educational leaders in PK-12 or higher education institutions.

During the treatment class the teaching intern instructed the participants to select one AethereoStick they will be using for the intervention session. Next, the teaching intern read the assigned script provided by the researcher (see Appendix F) and model for the

participants how to use the AethereoStick while holding them three inches from their nose.

Participants responded to a survey that queried a range of demographic items (i.e., age, gender, race, employment [full-time, part-time, or none]), as well as, items that determined the participants' perceived experience of utilizing the AethereoSticks among the treatment group. Data were collected from a total of 9 participants. Participants in the treatment group ($n = 6$) were 26-35 years old (50%), female (83%), and typically employed full-time (50%). Similarly, participants in the control group ($n = 3$) were 18-25 years old (67%), female (100%), and tended to be employed full-time (67%).

Although the total sample size due to the pandemic was exceedingly small, participants' responses nonetheless were analyzed to test the three hypotheses of the present study.

Hypothesis 1: It was hypothesized that the usage of aromatherapy would improve academic success amongst community college students as measured by final course grade.

Hypothesis 2: It was hypothesized that usage of aromatherapy would decrease perceived stress amongst community college students as measured by the Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983).

Hypothesis 3: It was hypothesized that usage of aromatherapy would promote the use of more adaptive coping mechanisms amongst community college students as measured by the Brief COPE (BCI; Carver, 1997).

Academic Performance

In order to test the first hypothesis, an independent t-test analysis was run to compare the final course grade between the control and treatment groups. Final course grade was rated on a 4-point scale with the following ratings (A= 4.00, A-=3.76, B+= 3.33, and B=3.00). There was no significant difference at post-test between control and treatment groups ($t[9] = .16, p = 0.87$). Therefore, Hypothesis 1 was rejected.

Perceived Stress

In order to test the second hypothesis, the Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983) was used to measure participants' perception of the degree to which situations in their life were perceived as stressful. The control group demonstrated moderate levels of stress at pretest ($M_{pss} = 22.67, SD = 4.61$) as well as at post-test ($M_{pss} = 26.00, SD = 5.92$). As expected on a paired t-test, there was no statistically significant difference ($t[3] = -1.38, p = 0.30$) between pre-test and post-test amongst the control group. The treatment group similarly demonstrated moderate levels of stress at both pre-test ($M_{pss} = 20.00, SD = 4.85$) and post-test ($M_{pss} = 24.00, SD = 2.96$). A paired t-test analysis showed no statistically significant difference ($t[6] = -1.65, p = 0.16$) at pre-test. At the time of pre-test, an independent-sample t-test confirmed there was no statistically significant difference in perceived stress between the control and treatment groups ($t[9] = 0.78, p = 0.45$). Unfortunately, an independent-sample t-test likewise demonstrated no statistically significant difference at post-test between the control and treatment groups ($t[9] = 0.74, p = 0.47$). Consequently, Hypothesis 2 was rejected.

Coping

In order to test the third hypothesis, the Brief COPE Inventory (BCI; Carver, 1997), along with the Kaufman Interpretation (J.A. Kaufman, personal communication, 2019; see Appendix C) was used to measure participants' coping skills. The control group demonstrated normal coping skills as pre-test ($M_{PROB} = 1.80$, $SD = 0.20$); $M_{EMOT} = 1.62$, $SD = 0.21$); and ($M_{MAL} = 1.73$, $SD = 0.66$). Post-test measures for the control group ($M_{PROB} = 1.36$, $SD = 0.45$); $M_{EMOT} = 1.54$, $SD = 0.36$) and ($M_{MAL} = 1.60$, $SD = 0.26$). A paired t-test for the control group showed no statistical significant difference in pre-test and post-test ratings in problem-focused ($t[3] = 1.98$, $p = 0.18$) emotion-focused ($t[3] = 0.28$, $p = 0.80$), or maladaptive-focused ($t[3] = 0.28$, $p = 0.80$).

The treatment group at pre-test demonstrated normal coping skills ($M_{PROB} = 2.81$, $SD = 0.47$; $M_{EMOT} = 2.25$, $SD = 0.34$) and ($M_{MAL} = 1.66$, $SD = 0.18$). Post-test measures showed the treatment group ($M_{PROB} = 2.25$, $SD = 0.35$); $M_{EMOT} = 2.31$, $SD = 0.33$) and ($M_{MAL} = 1.63$, $SD = 0.30$). A paired t-test showed statistically difference in participants problem-focused coping ($t[6] = 3.96$, $p = 0.01$), but no significant difference in emotional-focused ($t[6] = -0.44$, $p = 0.67$); or maladaptive-focused ($t[6] = 0.32$, $p = 0.75$). At the time of pre-test, an independent-sample t-test confirmed there was a statistically significant difference in problem-focused coping ($t[9] = -3.46$, $p = 0.01$) and emotional-focused ($t[9] = -2.82$, $p = 0.02$) between the control and treatment groups ($t[9] = 0.78$, $p = 0.45$). No statistically significant difference was shown between control and treatment groups maladaptive-focused ($t[9] = 0.24$, $p = 0.81$). An independent-samples t-test at post-test likewise demonstrated statistically significant difference between the control and treatment groups in problem-focused ($t[9] = -3.27$, $p = 0.01$) and emotional- focused $t[9]$

= -3.19, $p = 0.01$). No statistically significant difference was shown between control and treatment groups maladaptive-focused ($t[9] = -0.15$, $p = 0.87$). Thus, although the data suggest retention of the hypothesis three, the small sample size limits its ability to be meaningfully concluded and generalized to all college students.

Chapter V

Discussion

Summary of Findings

The impact of COVID-19 has posed many challenges for conducting research in academia (Mourad, Bousleiman, Wapner, & Gyamfi-Bannerman, 2020), one being the implementation of research at a social distance to limit “close contacts between individuals in order to reduce opportunities for transmission of the virus”(Morgan & Sargent, 2020, p.1). This has led to the “closure of many businesses, schools, government offices, and other institutions. Where possible, these institutions have continued to operate via telework and e-learning” (Morgan & Sargent, 2020, p. 1). This has also created an innovate way of conducting research via telepresence, a way in which this study had to be modified to ensure safety of participants and compliance with the institutional review board.

Nonetheless, the implications of these changes strongly impacted the target population and resultant sample size of the present study. Graduate level courses are typically smaller than undergraduate courses, thus this impacted the total number of participants available who participated in this study. The total students enrolled for both *Program Evaluation in Educational Leadership and Ethics in Leadership* totaled 25 graduates’ students. Amongst the 25 students across the two courses; 17 had given consent and participated in the study and pre-test protocols. However, eight of the participants data was removed due to non-completion of post-test measures. The resultant nine participants showed a gender disparity (1 male, 8 female) congruent with the trend of fewer men being enrolled in postsecondary education. In the United States, “there

were 2.4 million fewer men than women pursuing some form of postsecondary education in 2017” (Stoet & Geary, 2020, p. 14073). Data from the *National Center for Education Statistics* (2019) furthermore suggests lower enrollment of male in the upper Midwest university where this study was conducted; students enrolled in a full-time graduate program are majority White Female (45.1%), followed by White Male (17%) and Asian Female (2.27%).

It should also be noted that there was a disparity of employment status; the majority ($n=6$) of participants worked full-time. Full-time employment itself can pose many challenges. Demerouti, Peeters, & Van Der Heijden (2000) suggested that these challenges are seen in the form of inter-role conflict between work and family as: time-based, strain-based and behavioral based. Carlson, Kacmar, and Williams (2000) defined time-based as that conflict which occurs due to time constraint in one domain making it difficult to succeed in the other. Carlson, Kacmar, and Williams (2000) defined strain-based conflict as occurring when the pressure experienced in one domain interferes or spills over into the other domain. Behavior-based conflict is that which happens when behavioral expectation in one domain interferes with the other domain (p. 243). Through the experience of graduate school, working full-time and family life, these different roles and pressure can cause added stress and conflict if not properly balanced.

Implications

Although there was no statistically significant difference between control and treatment groups in final course grade as predicted by Hypothesis 1, further analysis showed a discrepancy in how the final course grade was calculated between the two courses utilized for subject recruitment. The final course grade for the treatment group

was based on percentage earned from three lab papers (25 points each) and one reflection paper (25 points each). For the control group, final course grade was based on course presentation (100 points) and five quizzes (25 points each). These dynamics of variations of course calculation can suggest that the classification of final course grade might not have been comparable to the workload needed to earn an “A” between the treatment and control groups.

Another factor for consideration with the calculation of final course grade might have been an expectation and possible pressure of *socialization* that may have been placed upon the participants through university expectation of graduate students' grades to “do well.” Weidman, Twale, & Stein (2001), states “for those entering graduate school, they must learn not only to cope with academic demands but also to recognize the values, attitudes, and subtle nuances reflected by faculty and peers to succeed in their new environment” (p. 16). This is often experienced through what Brim (1966) defined as socialization “the process by which persons acquire the knowledge, skills, and dispositions that make them a more or less effective member of their society” (p. 3). Further research suggests that students raise themselves to a higher level of cognitive and affect development to reach the expectation of these roles (Staton, 1990, p.2).

Regarding Hypothesis 2, data analysis showed no statistically significant difference in participants' perception of stress as measured by the Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983). However, further analysis showed that a majority of participants increased in their self-reported level of stress. Within the treatment group participants ($n=6$) age was dispersed amongst 18-25 years old ($n=1$), 26-35 years old ($n=3$), and 36-45 years old ($n=2$). Among the 26-35 years old all participants

reported an increase in their perception of stress, the majority (all but one subject) reporting moderated levels of perceived stress. The outlier in the group rated at both pre and post-test were rated as higher perceived levels of stress. Within the 36-45 years old range, participants' ratings varied where one participant saw a decrease in their moderate level of perceived stress and the other saw an increase. Amongst 18-25 years old range, the participant self-reported a decrease in their perceived level of stress. Within the control group participants ($n=3$) age was dispersed amongst 18-25 years old ($n=2$), and 36-45 years old ($n=1$). Amongst the 18-25 years old and 36-45 years old all participants ($n=3$) reported an increase in their perceived level of stress. Rating changed from moderate level of stress at pre-test to higher level of perceived stress at post-test.

One also might question whether age factored into perceptions of stress amongst the participants of the present study. Participants were evenly dispersed within age level for this study: 18-25 years old ($n=3$), 26-35 years old ($n=3$), and 36-45 years old ($n=3$). Research has shown that "there may also be developmental reasons why older adults appraise problems as less stressful. Older people (56 years of age and older), through their greater range of experiences, may have developed more coping resources and thus appraise problems as less stressful" (Aldwin, Sutton, Chiara, & Spiro, 1996, p. 180). Also, the "age differences in the amount of reported stress may be that older individuals cope in a different way than their younger counterparts (Aldwin, Sutton, Chiara, & Spiro, 1996, p. 180). The age of participants could have affected their development skills of how they handle and perceived stress. However, the age limitation of this study should be taken into consideration whereas the majority of participants were in the 18-35 (young

adult) and 36-55 (middle age) thus their increase of perceived stress can be influenced by their development age.

In the midst of COVID-19, quarantine has caused “separation from loved ones, the loss of freedom, uncertainty over disease status, and boredom can, on occasion, create dramatic effects” (Brooks et al., 2020, p. 912). These effects can be associated with a negative psychological experience (Brooks et al., 2020). Many of this stemmed from the loss of income, employment. Nirmita & Panchal (2020) stated “that more than half of the people who lost income or employment reported negative mental health impacts from worry or stress over COVID-19. Lower income people report higher rates of major negative mental health impacts compared to higher income people” (p. 2). Knowing the heightened stress of the current times consideration has to be given to the possibility that the increase of stress could have been influenced by the current stressful times and thus might have influenced coping mechanisms as tested via Hypothesis 3.

Bucci and Harris (2016) suggested that in the event of exposure of tolerable stress experienced by short periods of homeless, immigration or natural disaster the buffering of relationships causes individuals to return to homeostasis. Taylor (2006) similarly stated that if “social contacts are hostile or unsupportive, then psychological and biological stress responses are heightened. If social contacts are supportive and comforting, stress responses decline” (p. 273). Furthermore, Lazarus (1990) suggested that an individual’s perception of stress and contributing variables are impacted by their coping mechanisms. These coping mechanisms are believed by Lazarus to be contributing variables in how an individual perceived their level of stress. In the present study, data from a paired t-test of the Brief COPE Inventory (BCI; Carver, 1997) showed that the treatment group showed a

statistically significant difference in participants' problem-focused coping, but no significant difference in emotional-focused or maladaptive coping. Folkman and Lazarus (1980, 1985) demonstrated that problem-focused coping occurs when an individual "who perceives that (s)he can change the situation, whereas emotion-focused coping strategies are used when an individual perceives that nothing can be done to change potentially harmful or threatening situations" (McMillian & Morris, 2012, p. 645). Thus, this suggests that participants in the treatment group although there was an increase in their perceived level of reported stress participants that (s)he can change the situation. Further analysis of this among the control group demonstrated no statistically significant difference in pre-test and post-test ratings in problem-focused emotion-focused, or maladaptive coping. Thus, suggests that amongst the control group participants did not perceive that (s)he can change the situation nor does the individual perceive that nothing can be done to change potentially harmful or threatening situations.

Finally, participants in the treatment group were asked "Which AethereoStick did you use the most during this study?" Data analysis showed 50% of participants used *Citrus Melablend* (an essential oil blend of citrus and Melaleuca species); 33% used *Northwoods Blend* (an essential oil blend of black spruce, balsam fir, vetiver and white cypress), and 17% used *Calm* (an essential oil blend of blue cypress, frankincense, lavender, and Melaleuca species). Further data analysis showed that 67% of participants reported that using the Aethereostick during the semester helped them to manage stress. This trend appears to contradict the finding that there was no statistically significant effect on the Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983).

The selection of scents within the Aertthereostick should be noted as it may have an effect on the participants' mood, and psychological states. Herz (2009) speaks to this in the psychological hypothesis suggesting that responses to odors are learned through association with emotional experiences, and that odors consequently take on the properties of the associated emotions. Additionally, Herz (2009) mentioned that pharmacological hypothesis effect of scents on mood, physiology, is due to the "direct and intrinsic ability to interact and affect the autonomic nervous system/ central nervous system and/or endocrine systems" (p. 271). The participants prior experiences and beliefs about the selected scents for this study was not accounted for thus limited measures to test whether self-reported measures of participants were influenced by prior exposure and experiences. However, participants were able to choose which scent they wanted to use for each aromatherapy session. It should be noted that participants remained blind to that actually scents oil being used to limit that possible effect of the analgesic effect of aromatherapy occurring.

The concept of the placebo effect is what Benedetti and Amazon (1997) defined as "the nonspecific psychological or psychophysiological therapeutic effect produced by a substance or procedure that is without any therapeutic effect for the specific condition being treated" (p. 110). Participants remained blind to the labels of the scents they used in the treatment group; however, they were informed that their participation in the study was to see if aromatherapy will reduce stress. Masaoka, Takayama, Yajima, Kawase, Takakura, and Homma (2013), that giving such a description may "influence subjective emotional states and alter the effectiveness of aromatherapy or the outcomes" (p. 2). This notion posed another possible explanation for discrepancy between the participants' self-

report measure of the AethereoStick causing them feel less stress. Furthermore, Kaptchuk & Franklin (2015), states

“although research has revealed objective neuro-biologic pathways and correlates of placebo responses, the evidence to date suggests that the therapeutic benefits associated with placebo effects do not alter the pathophysiology of diseases beyond their symptomatic manifestations; they primarily address subjective and self-appraised symptoms” (p. 8).

It could be suggested that the measure of self-reported addressed the subjective measures of the participants’ perception of being less stressful, but due to this study limitation of exposure time to the treatment may not cause a significantly difference on Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983).

The *Northwoods Blend* (an essential oil blend of black spruce, balsam fir, vetiver and white cypress) scent is associated with the smell of outdoors forest. Participants' self-reported measure of feeling that AethereoStick helped manage their stress can be associated with the notion that the *Northwoods Blend* offered a forest bathing experience that emerges in nature through smell. Research suggested that foresting bathing has a physiological effect and relieves stress, anxiety, depression and anger through its phytoncides, which are “volatile essential oils emitted from various trees and plants and that act to protect the trees and plants against harmful microorganisms, insects, and animals” (Lee,Oh, Lee,Park, Ryu & Lee, 2012, p.1209).

Furthermore, the *Citrus Melablend* (an essential oil blend of citrus and Melaleuca species) and *Calm* (an essential oil blend of blue cypress, frankincense, lavender, and Melaleuca species) are thought to contain some of the oils that research has shown act as

an anxiolytic properties (Setzer, 2009; Zhang & Yao, 2019). National Cancer Institute (n.d) defines anxiolytic as a drug used to treat symptoms of anxiety, such as feelings of fear, dread, uneasiness, and muscle tightness, that may occur as a reaction to stress. Most anxiolytic agents block the action of certain chemicals in the nervous system.

Examination of the microbial properties of scents suggests that they can have an effect on the treatment participants' self-reported measure and the perception that the AethereoStick was working.

It also should be noted that the participants in the treatment group total exposure from aromatherapy session was fifteen minutes (experiencing five sessions at three minutes each). Although this amount is significantly low it should be noted that although no significant difference was shown on Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983); however, on self-report measure of participants believed that the treatment worked.

Strengths and Limitations

The present study offered a novel application of utilizing aromatherapy to reduce stress amongst graduate education leadership majors and can offer copious benefits. The usage of aromatherapy has been around since ancient times and the “essential oils market by 2022 is estimated to be valued at \$11.9 billion dollars which is an 8 percent increase since 2017” (Pearson, Cutshall, Hooten, Rodgers, Bauer & Bhagra, 2019, p.174). Chen, Fang, & Fang (2015), stated an alternative method that speaks to how aromatherapy can be used by incorporating its “usage into our daily life whereas the usage of aromatherapy is a simple non-invasive and cost-effective method to reduce stress” (p. 88). However, there remains a notable lack of research on this intervention.

Nonetheless, there were several methodological limitations of this study that are important to consider when examining results and implications of the sample size. The data from small-group studies are said to be *nonindependent*, “which means that persons who are in the same group are more similar (or dissimilar) to one another than are persons who are members of different group” (Kenny, Mannetti, Pierro, Livi, & Kashy, 2002, p.126). Due to the sample size ($n=9$), the probability of the sample being non-independent is quite likely. Kenny et al. (2002) listed three factors “that might produce nonindependence in groups: compositional effect (when persons are not randomly sorted into groups), common fate (when members of groups coexist in the same environment), and mutual influence (when one aspect of the group influences other aspects of the group)” (Dunnigan, 2013, p. 72). This is seen through the sample similarity amongst the control and treatment group with the majority of the participants being a white, female, aged 18-35 and working full-time. Thus, limiting the generalizability of the data as to be a full representative of graduate educational leadership majors.

Recommendations for Further Research

Stress is a complex-multidimensional phenomenon that affects college graduate students. Therefore, it may require multi-factorial or alternative ways to address and because of this it warrants further study on effective and cost-effective ways to decrease it amongst graduate college students.

First, in light of the limitations of the present study, it is strongly recommended that the general design be replicated with a much larger sample subsequent to the COVID-19 pandemic and the ability of classes to again meet in person.

Second, it is recommended that the present study be replicated with a more representative population of college students comprised of undergraduates and different college majors. Kaplan, Chambers, and Glasgow (2014) spoke to the need of representative sample size stating that “although large sample sizes and 'big data' have a number of strengths, studies can be of relatively little value if the large sample size is not representative of the population to which the results will be generalized” (p. 342).

Third it is recommended that the design of the present study be adapted and replicated within the PK-12 school population, perhaps with an emphasis in on the needs of those students receiving special education. Stress is an everyday challenge for school-aged children and is something that cannot be avoided. It has been estimated that 35% of American children experience stress-related problems (Kaplan, 2002). However, little research has explored ways to address stress amongst children. Aromatherapy could provide a low-cost, easy to implement adjunct to early childhood, primary, and secondary education classrooms.

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Appendix A

ID: _____

Instructions: The questions in this scale ask you about your feelings and thoughts during the last month. In each case, please indicate your response by placing an “X” over the circle representing how often you felt or thought a certain way.

	Never	Almost Never	Sometimes	Fairly Often	Very Often
1. In the last month, how often have you been upset because of something that happened unexpectedly?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. In the last month, how often have you felt that you were unable to control the important things in your life?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. In the last month, how often have you felt nervous and “stressed”?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. In the last month, how often have you felt confident about your ability to handle your personal problems?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. In the last month, how often have you felt that things were going your way?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. In the last month, how often have you found that you could not cope with all the things that you had to do?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. In the last month, how often have you been able to control irritations in your life?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. In the last month, how often have you felt that you were on top of things?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. In the last month, how often have you been angered because of things that were outside your control?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Appendix B

ID: _____

Instructions: The questions in this scale ask you about what you've been doing to cope with stress. In each case, please indicate your response by marking your answer:

1 = I haven't been doing this at all
a little bit.

2 = I've been doing this a

3 = I've been doing this a medium amount
lot

4 = I've been doing this a

	1	2	3	4
1. I've been turning to work or other activities to take my mind off things.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. I've been concentrating my efforts on doing something about the situation I'm in	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. I've been saying to myself "this isn't real."	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. I've been using alcohol or other drugs to make myself feel better.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. I've been getting emotional support from others	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. I've been giving up trying to deal with it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. I've been taking action to try to make the situation better.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. I've been refusing to believe that it has happened.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. I've been saying things to let my unpleasant feelings escape.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. I've been getting help and advice from other people.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. I've been using alcohol or other drugs to help me get through it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. I've been trying to see it in a different light, to make it seem more positive.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

13. I've been criticizing myself.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. I've been trying to come up with a strategy about what to do.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. I've been getting comfort and understanding from someone.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. I've been giving up the attempt to cope.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17. I've been looking for something good in what is happening.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18. I've been making jokes about it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19. I've been doing something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20. I've been accepting the reality of the fact that it has happened.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21. I've been expressing my negative feelings.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
22. I've been trying to find comfort in my religion or spiritual beliefs.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
23. I've been trying to get advice or help from other people about what to do.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24. I've been learning to live with it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
25. I've been thinking hard about what steps to take.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
26. I've been blaming myself for things that happened.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
27. I've been praying or meditating.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
28. I've been making fun of the situation.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Appendix C

Kaufman Interpretation of Brief COPE Inventory

Problem-focused Coping

Active coping: 2, 7

Use of instrumental support: 10, 23

Positive reframing: 12, 17

Planning: 14, 25

Acceptance: 20, 24

Emotion-focused Coping

Use of emotional support: 5, 15

Venting: 9, 21

Humor: 18, 28

Religion: 22, 27

Maladaptive Coping

Self-distraction: 1, 19

Denial: 3, 8

Substance Use: 4, 11

Behavioral disengagement: 6, 16

Self-blame: 13, 26

Appendix D

Demographic Survey Questions for Experimental Section

Brief Questionnaire:

Please answer the following questions:

1. Please rate your level of agreement with the following statement:

I feel that using the Aethereostick this semester help me to manage my
stress.

Strongly Agree Agree Neutral Disagree Strongly
Disagree

2. Which AethereoStick did I use the most during this study?

3. How old are you?

Under 18 years old 18-25 years old 26-35 years old
36-45 years old 46-55 years old 56 years or older

4. What is your gender?

Male Female Other

5. What is your employment status?

not working working part time working full time

Appendix E

Demographic Survey Questions for Control Section

(administered using the D2L Survey tool)

Brief Questionnaire (to be given at the end of the semester):

Please answer the following questions:

1.How old are you?

Under 18 years old	18-25 years old	26-35 years old
36-45ears old	46-55 years old	56 years or older

2.What is your gender?

Male Female Other

3.What is your employment status?

not working working part time working full time

Appendix F

Guided Script for Treatment Section

(To be read by instructor/intern)

Instructor: Before we begin our class today make sure you have your AethereoStick bag. If you do not please get it at this time. (allow students time to get their bag. If all students have their bag proceed)

You will need to take out only one AethereoStick from your AethereoStick bag that you will like to use for today intervention (give students a moment to select their AethereoStick)

Let's begin by having you unscrew the top off your AethereoStick. Now place your AethereoStick standing up on your desk (check to make students have the stick standing up and not laying down on their desk)

Watch me as I model for you today breathing session:

Breathe in...2....3....4..... hold...2...3....exhale...2....3....4....5... Smell the Aethereostick. Notice that I'm holding the stick three inches from my nose. When you use your AethereoStick make sure you have it three inches away from your nose.

Now let's do together:

Breathe in...2....3....4..... hold...2...3....exhale...2....3....4....5... Smell the Aethereostick. Noticed that I'm holding the stick three inches from their nose.

Now let me see you do this be yourself:

Breathe in...2....3....4..... hold...2...3....exhale...2....3....4....5... Smell your Aethereostick

Breathe in...2....3....4..... hold...2...3....exhale...2....3....4....5... Smell your Aethereostick

Breathe in...2....3....4..... hold...2...3....exhale...2....3....4....5... Smell your Aethereostick

Breathe in...2....3....4..... hold...2...3....exhale...2....3....4....5... Smell your Aethereostick