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Is Complementary and Alternative Medicine Effective in Reducing Self-Reported Anxiety Symptoms in College Students?

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Is Complementary and Alternative Medicine Effective in Reducing Self-Reported Anxiety Symptoms in College Students?

Abstract

Anxiety is the number one health issue college students seek help for on campus (Grasgreen, 2011). An estimated 62% of college students did not continue their studies due to suffering from anxiety (Lindsey, 2014). Psychotherapies such as cognitive behavioral therapy (CBT) and psychotropic medications have been used for many years to treat anxiety. CBT and medication have been found to be effective treatment strategies when individuals are compliant with treatment; however, both strategies require access to a trained professional and can become a financial burden. Therefore, complementary and alternative medicine (CAM) is a potential effective treatment strategy for anxiety, which can be affordable and used independently, without a trained professional. The purpose of this study was to determine if CAM modalities are effective in reducing anxiety symptoms in college students. The results of this study indicate that CAM modalities are effective at reducing both state and trait anxiety symptoms after a one-hour session in a designated relaxation space. The CAM Usage Survey indicated the most used CAM modalities and the most enjoyed CAM modalities were the massage chair and aromatherapy scoring the highest. The current study adds to the body of knowledge on effective treatment strategies for college student anxiety that are accessible and affordable (Ratanasiripong et al., 2012). The main recommendation from this study is reducing student anxiety by developing relaxation rooms equipped with massage chair(s) and aromatherapy on college campuses.

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Is Complementary and Alternative Medicine Effective
in Reducing Self-Reported Anxiety Symptoms in College Students?

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of the requirements for the degree
Ed.D. in Executive Leadership

Supervised by

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Dedication

As determined as I have always been, I still did not believe that I would be able to accomplish this doctorate program. I know that this achievement is not something that I did solely on my own. While I have made many sacrifices to achieve my doctorate, and it is true that it was my decision to use the resources afforded to me, I will never deny that I have lived a blessed and privileged life. My father sacrificed a lot to be the provider he has always been to me, and while he spent a lot of my childhood working away from home, he left me in the most capable and nurturing hands, where I marinated daily in maternal love, filled full of praise, inspiration, and empowerment—every ingredient needed for a success story. I knew very early in my life that the people who brought me into the world were very willing to invest whatever it took for me to succeed.

The choice to raise me on a dairy farm provided endless life lessons, particularly the importance of hard work with very little monetary reward. My childhood on the farm shaped and molded me into an ambitious contributor, and I knew early in life that I was a part of something that really mattered. My family depended on me to be ambitious, dedicated, passionate, and responsible; the consequence of not being those things was someone else picking up the slack. Farming has a very natural way of connecting you to something so much bigger than yourself. Digging up the earth, planting, then waiting for elements out of your control to contribute to its growth is what makes your contributions sustainable. It is cyclic and often mundane due to its repetitive nature, yet these practices prepared me for success in my quest to be a lifelong learner.

The dissertation process is much like my childhood lessons learned on my family farm. My parents, Ronald and Arlene Hall, will forever serve as my strong foundation, my most impactful teachers. I saw both of you as role models, you taught me how to love myself and be generous and kind to others, and because of your lessons, there is nothing too big for me to go after!

I would also like to thank Dr. Shannon Cleverley-Thompson and Dr. Melissa Ghera—you have served as “the elements out of my control,” and I am so appreciative of all your time, dedication, and contributions to my dissertation. Thank you to all of my DEXL professors—you all in some way have shaped me into an executive leader that is ready to contribute to society with the skills learned here at Fisher.

Thank you to my awesome cohort and to my team members Shannon McCarthy-Leone, Andrea Rock, and Sheila Strong. Wow, the struggle has been real, and this process would have been horrific without you on the journey with me. Thank you for your support, encouragement, and for just being kind and gracious humans. You are all talented, intelligent, vibrant leaders, and I am thankful to know that we will be lifelong friends. To my non-DEXL friends—you know who you are. I love and appreciate you. Thank you for cheering for me along the way.

To my nieces and nephews who inspire me daily to be a strong role model—thank you! A special thank you to my sister Shirley for her endless words of encouragement, for filling in for me at home when I needed to be away, and most importantly, doing thoughtful things that our mom would have done if she were still alive. To my niece Stef—we sure have been through a lot together, and now we can add that we shared the journey of becoming doctors together! You will forever be one of my all-time favorite

people. Todd, thank you for being an amazing dad, and for holding down the fort while I was away chasing a lifelong dream. I know the last two years have not been easy on you.

Lastly, to my sons Jake and Sully, I encourage both of you to go after the big things in life. Do not be afraid to do the work. There are no shortcuts, and every lesson is valuable if you allow it to be. I love you both. Thank you for challenging me in ways that cause me to reflect and encourage me to grow as a parent and as a role model in your lives. Jake, thanks for being a son that I can talk to. Being your parent has encouraged me to live a purposeful life. Sully, thanks for all the hugs and for finding me in the middle of the night because you missed me. In so many ways, your laugh, your smile, your energy, your persistence—every part of you—has served as my motivation to finish this doctorate program.

Biographical Sketch

Ms. Hollie Hall attended The State University at Brockport from 1996 to 2000 and graduated with a Bachelor's of Science degree in 2000. She attended Alfred University from 2002 to 2004 and graduated with a Master of Education degree in 2004. She came to St. John Fisher College in the summer of 2015 and began doctoral studies in the Ed.D. Program in Executive Leadership. Ms. Hollie Hall pursued her research in Is Complementary and Alternative Medicine Effective in Reducing Anxiety Symptoms in College Students under the direction of Dr. Shannon Cleverley-Thompson and received the Ed.D. degree in 2017.

Abstract

Anxiety is the number one health issue college students seek help for on campus (Grasgreen, 2011). An estimated 62% of college students did not continue their studies due to suffering from anxiety (Lindsey, 2014). Psychotherapies such as cognitive behavioral therapy (CBT) and psychotropic medications have been used for many years to treat anxiety. CBT and medication have been found to be effective treatment strategies when individuals are compliant with treatment; however, both strategies require access to a trained professional and can become a financial burden. Therefore, complementary and alternative medicine (CAM) is a potential effective treatment strategy for anxiety, which can be affordable and used independently, without a trained professional. The purpose of this study was to determine if CAM modalities are effective in reducing anxiety symptoms in college students. The results of this study indicate that CAM modalities are effective at reducing both state and trait anxiety symptoms after a one-hour session in a designated relaxation space. The CAM Usage Survey indicated the most used CAM modalities and the most enjoyed CAM modalities were the massage chair and aromatherapy scoring the highest. The current study adds to the body of knowledge on effective treatment strategies for college student anxiety that are accessible and affordable (Ratanasiripong et al., 2012). The main recommendation from this study is reducing student anxiety by developing relaxation rooms equipped with massage chair(s) and aromatherapy on college campuses.

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Chapter 1: Introduction

Anxiety is a major contributor to high morbidity and mortality rates in college students (Barrera & Norton, 2009; Beiter et al., 2015; Strine et al., 2008; Westfield et al., 2005; Zivin, Eisenberg, Gollust, & Golberstein, 2009). The American Psychiatric Association (APA, 2013) defines anxiety to be the anticipation of a future threat. For purposes of this study, the term anxiety refers to the anxiety symptoms an individual experiences. In 2015, 21.9% of college students reported that anxiety negatively affected academic performance, which reflects an increase that has nearly doubled over the past 15 years (Bamber & Schneider, 2016). If left untreated, anxiety symptoms can manifest into anxiety disorders (APA, 2013; Bamber & Schneider, 2016). College students who have been diagnosed with anxiety disorders report having a worse quality of life than individuals who do not struggle with anxiety (Barrera & Norton, 2009; Beiter et al., 2015). College student suicide attempts have also been linked to the decompensation of mental health from battling anxiety symptoms (Weisberg, Beard, Moitra, Dyck, & Keller, 2014; Westfield et al., 2005). Consequently, additional effective treatment strategies for college student anxiety could benefit students who are suffering from anxiety symptoms.

Strategies to treat anxiety symptoms that may be interfering with a college student's ability to be successful are important because these symptoms are interfering with a college student's academic performance and overall quality of life (Oman, Shapiro, Thoresen, Plante, & Flinders, 2008; Ratanasiripong et al., 2012). Anxiety can manifest in many different ways. Anxiety symptoms that are common in all anxiety

disorders are numbness or tingling, feeling hot, feeling shaky, inability to relax, trouble sleeping, a fear that the worst thing possible will happen, feeling dizzy or lightheaded, rapid heartbeat, feeling afraid, nervousness, feeling of choking, trembling hands, fear of losing control, difficulty breathing, fear of dying, indigestion, feeling faint or lightheaded, flushed face, and/or hot or cold sweats (Beck, Epstein, Brown, & Steer, 1988).

One effective treatment strategy for those suffering from anxiety symptoms is cognitive behavioral therapy (CBT), an evidence-based, solution-focused therapy developed by Aaron Beck in the 1960s (Bandelow et al., 2015; Kaufman & Baucom, 2014; Westra & Dozois, 2006). CBT is a treatment strategy mental health professionals utilize to help people make connections between their thought patterns and behaviors and highlight how these thinking patterns are unproductive and unhealthy (Beck, 1976). The goal of CBT is to help people learn new ways of thinking, which in turn may stimulate confidence in the person's ability to learn how to effectively handle negative thought patterns and replace them with empowering and productive ones (Beck, 1976). However, due to college students' less than optimal treatment compliance and recovery rates with CBT, other strategies are needed to effectively treat college student anxiety (Aviram, Westra, Constantino, & Antony, 2016; Westra & Dozois, 2006).

CAM practices may be an effective strategy for the college student population. CAM has been defined by the National Center for Complementary and Alternative Medicine (NCAAM) as being "a group of diverse medical and health care systems, practices, and products that are not presently considered to be a part of conventional medicine" (Bystritsky et al., 2012, p. 266). CAM practices may assist individuals with increasing mindfulness (Langer & Moldoveanu, 2000a; Mhatre, Artani, & Sansgiry,

2011; Synovitz, Gillan, Wood, Nordness, & Kelly, 2006). Jon Kabat-Zinn's (2003) definition of mindfulness is "the awareness that emerges through paying attention on purpose, in the present moment, and nonjudgmentally to the unfolding of experience moment by moment" (p. 145). Kabat-Zinn was the architect of the first intervention using mindfulness to reduce stress levels, known as mindfulness-based stress reduction (Evans et al., 2008). Bamber and Schneider (2016) referred to mindfulness as "multi-faceted and includes meditative techniques to attain the four constructs: attentional control, awareness, non-judgmental thought, and non-reactivity" (p. 28). These constructs originated from Kabat-Zinn's (2003) definition of mindfulness. Kabat-Zinn (2003) believed that mindfulness involves aspects of awareness and attention, and can be discovered and nurtured through meditative practices.

A connection can be made between increased mindfulness and an individual's improved emotional well-being (Caldwell, Emery, Harrison, & Greeson, 2011; Langer, 2014). The shift in treatment paradigms from CBT to increased mindfulness through the use of CAM practices indicates a transition from conventional treatment to a more holistic approach for the treatment of anxiety. Multiple effective treatment strategies for anxiety are needed because people react differently to treatment. For example, some people have negative side effects to medication while others respond well and experience a reduction in anxiety symptoms (Bandelow et al., 2015). Anxiety symptoms are caused by a variety of reasons, and an accurate diagnosis may help determine an effective treatment strategy to combat anxiety symptoms.

Anxiety Overview

Clinical diagnosis of anxiety. The American Psychiatric Association (2013) has categorized anxiety disorders in the *Diagnostic and Statistical Manual of Mental Disorders*, 5th edition (DSM-5) within three categories: anxiety disorders, obsessive-compulsive and related disorders, and trauma-and-stressor related disorders. Anxiety disorders are characterized as disorders that exhibit features of severe anxiety and excessive fear (APA, 2013; Hooley, Butcher, Nock, & Mineka, 2017). “*Fear* is the emotional response to real or perceived imminent threat, whereas *anxiety* is the anticipation of future threat” (APA, 2013, p. 189). These disorders are independent of one another; however, they may overlap and are highly comorbid (APA, 2013). The diagnosis of an anxiety disorder is determined by a thorough assessment of the content of the beliefs and thoughts, as well as the types of situations that are feared or avoided (APA, 2013). For example, a person who was diagnosed with social anxiety disorder would be fearful of social situations and exhibit anxiety symptoms and avoidance behavior (APA, 2013). What distinguishes an anxiety disorder from fear or anxiety symptoms is how persistent and excessive the symptoms are experienced by individuals. If anxiety symptoms are recurring, frequent, and last 6 months or longer, then a provisional diagnosis of an anxiety disorder may be given by a trained professional (APA, 2013).

While each anxiety disorder is unique, they are also all built on the cornerstone of anxiety and fear (APA, 2013). Anxiety is a physiological and psychological response to a perceived threat, which affects an individual behaviorally, cognitively, emotionally, and/or physically (Basak & Hansda, 2016; Kang, Choi, & Ryu, 2009). Experiencing

anxiety is normal and is the body's response to the presence of a stressor (Lindsey, 2014). CAM modalities, as an intervention, could potentially serve as a preventative measure for college students who have state and/or trait anxiety symptoms (Spielberger, 1977). The state-trait definition of anxiety capitalizes on the differences between anxiety that occurs because of an event and is short-term (e.g., state anxiety) versus the anxiety that is more plaguing and long-term (e.g., trait anxiety) (Spielberger, 1977). Examining CAM usage in college students, as well as if CAM modalities reduce state and trait anxiety symptoms, could provide college campuses with a road map in the development of holistic and effective treatments for college student anxiety symptoms.

In summary, anxiety disorders are pervasive and best understood as disorders manifesting from severe anxiety and excessive fear experienced over a longer period of time (APA, 2013; Hooley et al., 2017). If college student state and trait anxiety symptoms are left untreated, these symptoms may escalate into an anxiety disorder (Somerville, Whalen, & Kelley, 2010). State and trait anxiety symptoms are prevalent in the United States, and the results of this study intend to provide support to the premise that CAM is effective in treating anxiety symptoms.

Evaluation of anxiety symptoms in research. While the clinical diagnosis of anxiety disorders is clear and structured (APA, 2013), in research, anxiety is defined in multiple ways by various theorists. Barlow, Allen, and Choate (2004) defined anxiety as a natural occurrence, which can help people function at optimal level when symptoms do not reach the severity of meeting an anxiety disorder. Barlow et al. (2004) believed that anxiety disorders are a blend of biological and psychological factors that, when added to stress, could manifest into an anxiety disorder. Kagan and Snidman (1999) theorized that

regardless of the environmental factors, biological factors determine if an individual will be anxious or not. This claim is supported by longitudinal studies involving individuals during childhood and adulthood (Kagan & Snidman, 1999). Neurological findings, such as children with narrower facial bones, are predictive of higher anxiety levels in children (Kagan & Snidman, 1999). Additionally, anxiety symptoms in later development are more prevalent in people who were highly reactive as infants as well as extra sensitive to unfamiliar events as toddlers (Kagan & Snidman, 1999).

Spielberger (1975), Lau, Eley, and Stevenson (2006), and Basak and Hansda (2016) believed that anxiety consists of two constructs known as state anxiety and trait anxiety. State anxiety is temporary, considered an emotional state, and goes away when the perceived threat is no longer present (Basak & Hansda, 2016; Spielberger, 1975). College students may experience state anxiety leading up to an exam or a presentation, or in a social situation where everyone is new and the expectations are not clear.

Trait anxiety is a personality trait; it is an individual's vulnerability to respond to a stressor or fear, which in turn elicits anxiety symptoms (Basak & Hansda, 2016; Garcia et al., 2013; Lau et al., 2006; Spielberger, 1975). Spielberger, Pollans, and Worden (1984) inferred that individuals with high trait anxiety symptoms are more sensitive to stressors and therefore perceive most situations as threatening and dangerous. McLean and Anderson (2009) examined how gender differences influence an individual's susceptibility to feelings of fear and anxiety and found that genetic factors, such as heritability and hormonal differences, are closely related to an individual's vulnerability to respond to a stressor—also known as experiencing trait anxiety. For example, a college student moves into a residence hall and meets a new roommate, but the anxiety

symptoms do not subside due to fear that the roommate may harm them. Trait anxiety symptoms are long-term, and those who suffer from trait anxiety feel anxiety symptoms in situations that do not cause long-term anxiety for the majority of people (Spielberger, 1977). Trait anxiety may lead to an anxiety disorder when an individual's schema, or cognitive framework, is maladaptive (Lindsey, 2014). "Maladaptive schemas that are more pervasive and accessible are thought to induce more negative emotions and last longer than less pervasive maladaptive schemas" (Lindsey, 2014, p. 408). Therefore, if a maladaptive schema is triggered repeatedly, it will become "automatic, more ingrained, and more resistant to change" (Lindsey, 2014, p. 408).

When a person persistently experiences anxiety, which may be indicated by high levels of trait anxiety scores on Spielberger's (1977) State-Trait Anxiety Inventory (STAI), he or she may seek clinical help, which can be inconvenient and/or expensive. Consequently, CAM practices may be an effective strategy to treat trait anxiety symptoms. Additionally, for many college students, stress seems to lead to anxiety, especially around finals, which may be indicated by high levels of state anxiety scores on the STAI. CAM may also be effective at treating state anxiety symptoms.

Anxiety Disorders in the United States

Henriques, Keffer, Abrahamson, and Horst (2011) reported that anxiety levels and prevalence is on the rise. Anxiety is a major contributor to the morbidity and mortality rates in the United States (Strine et al., 2008). The Behavioral Risk Factor Surveillance System (BRFSS), launched in 2006, is a state-based surveillance system managed by state health departments and is a joint initiative with the Center for Disease Control (Strine et al., 2008). Data collected from 38 states revealed that 16.3 million Americans

reported a doctor had told them they had anxiety, with 4.2% of the respondents reporting having an anxiety disorder (Strine et al., 2008).

The Anxiety and Depression Association of America (ADAA.org, 2016a) released research findings that 7 out of 10 American adults are struggling with anxiety on a daily basis (Beiter et al., 2015). The ADAA listed anxiety to be the most prevalent mental disorder in the United States, estimating 40 million Americans over the age of 18 are negatively impacted by anxiety symptoms (ADAA.org, 2016a; Weisberg et al., 2014). Anxiety has become a tremendous financial burden for Americans. Approximately \$42 billion a year is spent on treating anxiety disorders, and over \$22 billion is spent on incurred costs from repeated medical visits for the treatment of anxiety disorders (ADAA.org, 2016a; Hooley et al., 2017). Anxiety disorders may lead to several medical conditions such as chronic pain, asthma, hypertension, irritable bowel syndrome, cardiovascular disease, and arthritis (Hooley et al., 2017).

Additionally, about 29% of the United States' population develop an anxiety disorder during their lifetime; anxiety disorders are the most common diagnoses for women and second most common for men (Hooley et al., 2017). In 2005, over a 12-month period, 4.1% of the American adult population were experiencing anxiety disorders classified as severe (Kessler, Chiu, Demler, & Walters, 2005). Genetics, personality, life events, and even brain chemistry contribute to a person's susceptibility to an anxiety disorder (ADAA.org, 2016a; Hooley et al., 2017). The prevalence of anxiety disorders in the United States highlights the need for more effective and comprehensive treatment strategies that are designed to reduce the onset of an anxiety disorder by treating stress and anxiety symptoms (Ratansiripong et al., 2012).

Several treatment strategies have been utilized to address state and trait anxiety symptoms in the United States. There is a need for more treatment initiatives to improve the mental health of Americans before their mental health issues become severely debilitating (Eisenberg, Gollust, Golberstein, & Hefner, 2007). Strategies that are easy to access, affordable, and conducive to people's lifestyles may decrease prevalence and prevent symptoms from manifesting into an anxiety disorder. Medication, cognitive behavior therapy (CBT), and CAM are some of the main treatment strategies used by individuals diagnosed with both state and trait anxiety as well as those experiencing or reporting anxiety symptoms.

Medication. Medication is a popular treatment strategy for anxiety disorders in the United States (ADAA.org, 2016b) and may be prescribed by a medical provider to treat both state and trait anxiety. The ADAA estimates 1 out of 10 Americans take anti-anxiety medications daily (ADAA.org, 2016b). There are a variety of different medications to treat anxiety disorders, which are divided into the following four major classes: (a) selective serotonin reuptake inhibitors (SSRIs), (b) serotonin-norepinephrine reuptake inhibitors (SNRIs), (c) benzodiazepines, and (d) tricyclic antidepressants (ADAA.org, 2016b; APA, 2013; Hooley et al., 2017). There are advantages and disadvantages to taking medication, and providers often prescribe with a recommendation to also attend therapy (ADAA.org, 2016b; Hooley et al., 2017).

Some of the advantages to medication in the treatment of anxiety disorders are that benzodiazepines, such as Xanax and Klonopin, alleviate acute anxiety symptoms nearly instantly, taking 30 to 60 minutes to work (Hooley et al., 2017). SSRIs, SNRIs, and tricyclic medications are not addictive and have shown success at alleviating

comorbid depressive symptoms and anxiety disorder symptoms simultaneously (Hooley et al., 2017). SSRI medications are prescribed more frequently in the United States than tricyclic and benzodiazepine medications because SSRIs are more tolerable and do not have addictive tendencies (Hooley et al., 2017; Kimmel, Roy-Byrne & Cowley, 2015). However, SSRIs do take time to reach full levels in the body (ramp up) as well as time to wean off (ramp down) (Hooley et al., 2017).

Some of the disadvantages of medication in the treatment of anxiety are that benzodiazepines are highly addictive and create a physiological dependence in those taking the medications (Hooley et al., 2017). The physiological dependence causes the person to need higher dosages of the medication to obtain the same results, and when the medication is discontinued, withdrawal symptoms such as dizziness, sleep disturbance, and nervousness are experienced (Hooley et al., 2017). Benzodiazepines can also cause impaired motor and cognitive functions, with drowsiness and sedation being two of the most common side effects (Hooley et al., 2017). SSRIs, SNRIs, and tricyclic medications take approximately 4 weeks before having any positive effects on anxiety symptoms and can cause undesirable side effects (Hooley et al., 2017). Tricyclics can cause constipation, dry mouth, blurred vision, and SSRIs can interfere with sexual arousal (Hooley et al., 2017).

The undesirable side effects impact people's willingness to take the medication as prescribed, and discontinued use of the medication increases relapse rates, especially for those who discontinue use of benzodiazepine medications (Kimmel et al., 2015). The recurrence of anxiety symptoms is detrimental to individuals who thought their anxiety was no longer an issue (Hollon, Stewart, & Strunk, 2006). Another disadvantage with

medication as a form of treatment is that medication has to be adjusted, changed, and closely monitored by a medical provider (ADAA.org, 2016b; Hooley et al., 2017). The combination of anti-anxiety medication and CBT is producing better success in the treatment of anxiety than any medication or treatment alone (Hooley et al., 2017)

Cognitive behavior therapy (CBT). CBT is the primary approach in treating anxiety symptoms and disorders in the United States (Chavira et al., 2014; Westra & Dozois, 2006). CBT can be best defined as a therapeutic approach where a therapist trained in CBT assists a client with combatting dysfunctional thoughts and cognitive distortions and replacing them with healthier thinking patterns (CBT, 2016; Hooley et al., 2017). CBT has been found to be an effective treatment strategy for anxiety but also has disadvantages (Chavira et al., 2014; Westra & Dozois, 2006).

CBT has been found to be as effective as benzodiazepine medication in alleviating anxiety symptoms. Specifically, some of the advantages to CBT in the treatment of anxiety is that it has been effective both combined with medication and as a standalone treatment at reducing symptoms in those that suffer with generalized anxiety disorder and panic disorder (Hooley et al., 2017). CBT is also an effective strategy for those seeking to lessen dependency on benzodiazepines (Gosselin, Ladouceur, Morin, Dugas, & Baillargeon, 2006).

Some disadvantages to CBT in the treatment of anxiety symptoms are access, failure to comply, and the stigma experienced by those receiving therapy (Hooley et al., 2017; Westra & Dozois, 2006). CBT has to be administered in a therapeutic setting by a therapist trained in CBT, which means those seeking to use CBT must have access to such a therapist (Hooley et al., 2017). Additionally, Westra and Dozois (2006) reported

that failure to comply with more traditional treatment procedures like CBT may be a reflection of a client's unwillingness to change. The stigma associated with traditional counseling may also affect treatment compliance (Ratansiripong et al., 2012). In order for CBT to work, patients must have skills that include being motivated, patient with the process, and willing to make changes in thought and behavior (Westra & Dozois, 2006). All anxiety sufferers may not possess these three skills. Therefore, some people who suffer from anxiety need additional treatment methods in conjunction or in place of CBT, such as medication or other forms of counseling intervention (Ahmed & Westra, 2009; Hooley et al., 2017; Westra & Dozois, 2006).

Complementary and alternative medicine (CAM). Conventional medicine such as CBT or medication has been effective in treating anxiety symptoms; however, individuals report using CAM practices in addition to conventional medicine to alleviate anxiety symptoms (Bystritsky et al., 2012). Despite a distinct lack of empirical evidence of CAM's effectiveness as a standalone treatment strategy for anxiety symptoms (Ratansiripong et al., 2012), CAM usage has grown over the last 20 years (Bystritsky et al., 2012; Nowak et al., 2015). Nowak et al. (2015) predicted that CAM usage will continue to increase because of the Patient Protection and Affordable Care Act (2010), which requires that insurance companies not discriminate against licensed medical providers who are utilizing CAM strategies in treatment protocols. This Act provided credibility to CAM practices as an effective treatment strategy for anxiety.

CAM practices can be categorized into five domains: (a) alternative medical system, (b) mind-body interventions, (c) biologically based therapies, (d) manipulative

and body based practices, and (e) energy therapies (Mhatre et al., 2011; Synovitz et al., 2006). Some CAM practices fall into more than one of the domains.

Alternative medical system. CAM practices that fall under the alternative medical system are rooted in theory and practice (Synovitz et al., 2006) and include practices such as traditional Chinese medicine and Ayurvedic medicine. Traditional Chinese medicine (TCM) is a variety of medicine practices that originated in China over 2,000 years ago. As indicated by the National Center for Complementary and Integrative Health (NCCIH, 2016b), these practices include various forms of herbal medicine, acupuncture, massage, exercise, and dietary therapy. Ayurvedic medicine is one of the world's oldest medical systems and was developed in India over 3,000 years ago (NCCIH, 2016a; Pandey, Rastogi, & Rawat, 2013). The practices that fall under Ayurvedic medicine continue to be used within India's traditional health care systems and promote the use of special diets, herbal compounds, and other unique health practices (NCCIH, 2016a; Pandey et al., 2013).

Mind-body interventions. Mind-body interventions can be described as the usage of mind-body techniques to enhance body functions (Mhatre et al., 2011) and are the most commonly used form of CAM practices (Wahbeh, Elsas, & Oken, 2008). Examples within the mind-body domain are relaxation, breathing techniques, biofeedback, yoga, hypnosis, meditation, art, music, prayer, tai chi, and dance (Synovitz et al., 2006). Holzel et al. (2011) linked mindfulness practices, such as meditation, to increased brain gray matter density in as little as 8 weeks. These structural changes in brain chemistry in areas of the brain associated with mental health provide support that CAM practices are effective at improving mental health (Holzel et al., 2011).

Biologically based therapies. Biologically based therapies can be described as the consumption of substances found in nature, such as herbs, vitamins, and/or food (Mhatre et al., 2011). Some of the most common examples of CAM practices within this domain are aromatherapy, herbal medicine, vitamins, and dietary supplements (Mhatre et al., 2011). Usage of these CAM practices has been linked to users receiving recommendations from a reliable and trustworthy source, such as a health care provider, a close family member, or someone of influence to the user (Mhatre et al., 2011).

Manipulative and body based practices. Manipulative and body based practices can be described as the manipulative movement of one or more body parts. Examples of CAM practices within this domain are yoga and osteopathic and chiropractic massage. Manipulative and body based practices have been linked to users who tend to use CAM practices either for chronic conditions or for enjoyment and/or health promotion (Nowak et al., 2015).

Energy therapies. Energy therapies are the final domain of alternative therapies (Mhatre et al., 2011). CAM practices within the energy therapies domain are used to create health and peace in an individual, as well as develop a state of balance (Mhatre et al., 2011). Most CAM energy therapies are based on the idea that a subtle life-force energy pervades all living things (Asbestos.com, 2016). The most popular forms of energy therapy are qigong, Reiki, pulsed fields, magnetic fields, and therapeutic touch (Synovitz et al., 2006).

In summary, the pervasiveness of anxiety in our nation demands treatment strategies that are accessible and inexpensive and have little to no side effects (Henriques et al., 2011; Ratanasiripong et al., 2012). The American College Health Association

(ACHA, 2015) found anxiety to be the number one contributing factor impeding academic success of college students. College student anxiety symptoms have also been linked to a decline in mental health and can have negative implications through the course of young people's lives (Oman et al., 2008; Ratanasiripong et al., 2012). Medication, CBT, and CAM are all treatment strategies for anxiety symptoms in the United States. Medication and CBT require ongoing access to a trained professional frequently over an extended period in order for the professional to prescribe and monitor medication and/or provide therapy. The limited access, frequency, and cost of appointments and/or prescription costs may affect compliance rates (Hooley et al., 2017; Westra & Dozois, 2006). However, CAM can be easy to access and cost effective. Once introduced to CAM modalities by a trained professional, individuals can utilize CAM frequently and independently at little to no cost (Nowak et al., 2015; Ratanasiripong et al., 2012).

Problem Statement

Traditional college students, ages 18 to 24, are at high risk for developing anxiety disorders due to age, lifestyle, and prolonged academic and social stressors (Hunt & Eisenberg, 2010). College students often feel pressure from multiple sources, such as academic and social stressors, financial stress, and pressure from loved ones to succeed. When students do not have access to resources that help to self-regulate, they struggle to cope (Bamber & Schneider, 2016). For the purposes of this study, college student anxiety symptoms refer to any number of occurrences that negatively affect a college student's problem solving, memory, concentration, academic performance, and quality of life (Bamber & Schneider, 2016; Beck et al., 1988).

College student anxiety symptoms are a significant burden and if untreated may lead to illness, depression, rumination, isolation or avoidance, and other physical or psychosomatic ailments (Bamber & Schneider, 2016). This burden can manifest itself as stress, sleep disturbance, eating disorders, depression, suicide, and anxiety disorders (Ratanasiripong et al., 2012). Trait anxiety symptoms, especially if left untreated, negatively affect the mental health and socioeconomic status of young adults (Hunt & Eisenberg, 2010). On average, young people who are experiencing mental health issues wait 8 to 10 years to seek out professional help (Eisenberg et al., 2007). College wellness centers that provide effective treatment strategies for reducing college student anxiety symptoms may decrease the amount of time young adults wait to receive treatment for anxiety symptoms (Hunt & Eisenberg, 2010).

Anxiety is affecting college retention and persistence to graduation rates (ACHA, 2015; Ratanasiripong et al., 2012). The ACHA (2015) found stress and anxiety to be the two largest contributing factors impeding academic success of college students. Anxiety is a financial and emotional burden for many college students, inhibiting their ability to be successful both academically and socially (Bamber & Schneider, 2016; Zivin et al., 2009). College students face many pressures, and when resources are limited because of access or cost, these pressures can lead students to become anxious and stressed beyond their limits (Ratanasiripong et al., 2012). The current study intends to add to the body of knowledge on effective treatment strategies for college student anxiety that are accessible and affordable (Ratanasiripong et al., 2012).

Prevalence of College Student Anxiety in the United States

College student anxiety research dates back to the 1950s with the development of the first anxiety measure (Head & Lindsey, 1983). Head and Lindsey (1983) reported this early research determined that highly anxious college students did not do as well academically as their less anxious peers. Behavior modification programs, which are therapy approaches focusing on the behavior of students, had the most success at reducing college student anxiety (Head & Lindsey, 1983). Therefore, in the 1950s colleges were encouraged to develop behavior modification programs to reduce college student anxiety through programming efforts intended to reward academic success (Bamber & Schneider, 2016; Head & Lindsey, 1983).

College student anxiety continues to be an issue and very much on the rise (ACHA, 2016). Therefore, effective treatment strategies to assist students with managing stress levels and state and trait anxiety symptoms are needed. The current study identifies whether students are suffering from state anxiety or trait anxiety symptoms and determines if CAM modalities are effective strategies for treating both constructs. One example of college student state anxiety is when students spend time studying for exams and then report that they panicked and could not recall any of the information during the exam. An example of college student trait anxiety is a student whose attendance is poor because he or she feels excessively nervous about attending or participating in class due to a perceived threat. Students' quality of life may be impacted because their anxiety symptoms are debilitating and they are unable to participate in social activities and/or perform academically.

In the United States, nearly half of the medical issues in the young adult population are due to mental disorders (Hunt & Eisenberg, 2010). People who suffer from severe mental disorders experience first onset before the age of 24 (Hunt & Eisenberg, 2010). Basak and Hansda (2016) reported that mental disorders are increasing amongst the college student population, with anxiety being identified as the most prevalent issue. When an individual's stress level is low, stress can serve as a motivator; however, high levels of stress, when not addressed appropriately, often manifest into anxiety (Hughes, 2007; Kang et al., 2009). The American College Health Association (2015) reported that 53.5% of college students reported experiencing high or extreme levels of stress. High levels of stress affect college students psychologically, socially, and academically (Kang et al., 2009; Ratanasiripong, Sverduk, Prince, & Hayashino, 2010). Oman et al. (2008), Henriques et al. (2011), Ratanasiripong et al. (2012), and the ACHA (2015) found the number of college students seeking mental health treatment in higher education institutions has increased over the past 10 years. In accordance, approximately 11% of college students seek professional help at college counseling centers to manage anxiety symptoms (Basak & Hansda, 2016). An estimated 62% of college students list anxiety to be one of the most common reasons for not continuing college (Basak & Hansda, 2016).

College students suffering from anxiety disorders before college may have already received treatments like CBT and/or psychotropic medication. When entering college, students may abandon previous treatment approaches, hoping that a new experience may alleviate anxiety symptoms. College may be a time for students to try something new or utilize a different treatment strategy. The college student population

might prefer CAM to other traditional models of treatment strategies because it is unorthodox and may better align with their personal belief system and lifestyle (Bishop, Yardley, & Lewith, 2007).

The current study examined which types of CAM practices are used by college students and if there is a change in reported anxiety symptoms after utilizing CAM modalities. Traditional counseling methods have been shown to be effective in helping college students balance stress and anxiety symptoms (Ahmed & Westra, 2009; Westra & Dozois, 2006). However, other studies suggest that there may be more effective treatment strategies for college student anxiety in place of traditional counseling methods (Caldwell et al., 2011; Henriques et al., 2011; LaCaille & Kuvaas, 2011; Nowak et al., 2015; Oman et al., 2008; Ratanasiripong et al., 2012; Synovitz et al., 2006). LaCaille and Kuvaas (2011) suggested that some college students seek out and use CAM practices as a way to better manage anxiety symptoms. Therefore, CAM practices could be an effective treatment strategy to combat college student anxiety.

Untreated college student anxiety symptoms may lead to illness, depression, rumination, isolation or avoidance, and other physical or psychosomatic ailments (Bamber & Schneider, 2016). Many college students feel pressure from various sources, and some may struggle to cope when they do not have access to resources. This mental pressure can manifest itself into stress, sleep disturbance, eating disorders, anxiety, depression, and suicide (ACHA, 2015; Kang et al., 2009; Ratanasiripong et al., 2012). The amount of college students with anxiety disorders is on the rise (ACHA, 2015; Bamber & Schneider, 2016; Henriques et al., 2011). Anxiety is considered the most prevalent mental health diagnosis amongst the college student population; as a result,

more research is needed to effectively treat college student anxiety (ACHA, 2015; Bamber & Schneider, 2016; Grasgreen, 2011; Head & Lindsey, 1983; Lindsey, 2014).

College can be an environment for students to learn and be exposed to a variety of health and wellness initiatives to aide them in making informed decisions about their well-being. College campuses can provide an opportunity for mental health professionals to focus on prevention, detection, and treatment for mental disorders that often have first onset during young adulthood (Zivin et al., 2009). Effective treatment strategies for college student anxiety may have a positive impact on a college student's social, economic, and educational outcomes (Zivin et al., 2009).

Anxiety is a serious societal issue, and there are gaps in the literature on how to effectively treat college student anxiety (ACHA, 2015; Barrera et al., 2009; Beiter et al., 2015; Grasgreen, 2011; Hunt & Eisenberg, 2010; Ratanasiripong et al., 2012; Zivin et al., 2009). CBT and medication has been utilized as an anxiety treatment of choice for mental health professionals. However, there is a lack of empirical research supporting traditional treatment strategies, such as CBT's and medication's effectiveness among the college student population. CBT and medication can be ineffective because these treatments require students to have access to a highly trained mental health and/or medical professional; often these services are not free or easily accessible on college campuses (Hooley et al., 2017; Ratanasiripong et al., 2012; Westra & Dozois, 2006). Accessibility and affordability have been found to be barriers as to why college students are not seeking out treatment (Ratanasiripong et al., 2012).

CAM appears to be emerging as a popular strategy for college students attempting to manage anxiety symptoms (Liu et al., 2014; Synovitz et al., 2006). CAM practices

may be utilized by students who are self-medicating mental health symptoms, yet there is little research on how colleges are providing these services to students (Mhatre et al., 2011). To address this empirical research gap, Ratansiripong et al. (2012) recommended that future research focus on colleges providing CAM practices to reduce college student anxiety symptoms. The current study investigated the utilization of CAM practices by students on a college campus as a strategy to reduce anxiety and practice mindfulness.

Theoretical Rationale

The theoretical lens of Ellen Langer's (1989) mindfulness theory was employed in this study. Langer's theory assumes that when an individual lives mindfully, he or she is living in the moment and is not concerned about how other people think about him or her (Dryden & Still, 2006). Living mindfully means individuals are living authentically, are engaged with their surroundings, and are not distracted with concern about approval from others or negative thoughts of self (Dryden & Still, 2006). Mindfulness is a CAM practice (Caldwell, 2011); the ability to be mindful, is when one is aware and actively participating in the present (Dryden & Still, 2006). The term mindfulness is an attempt to describe how one is aware of their present being without judgment (Haigh et al., 2011).

Mindfulness originates from Buddhist roots and has been translated differently by many researchers (Haigh, Moore, Kashdan, & Fresco, 2011). Fields such as psychology and ethics have used the term mindfulness dating back many years, though it was not until around 1990 that mindfulness became a major source of study in the realm of understanding one's quality of being (Dryden & Still, 2006). Mindfulness theory is rooted in the Western psychological perspective and views mindfulness as a process (Langer & Moldoveanu, 2000a). Langer and Moldoveanu (2000b) reported that the term

mindfulness can best be described as “the process of drawing novel distinctions” (p. 2). The idea behind this concept is that one can take notice of a stimulus, regardless of its significance or lack thereof (Langer & Moldoveanu, 2000b). While other researchers, such as Jon Kabat-Zinn, have utilized mindfulness as a therapeutic technique for the purposes of this study mindfulness theory will be applied as a theoretical framework (Bamber & Schneider, 2016; Dryden & Still, 2006).

Langer (2014) found that some behaviors indicative of mindfulness can have a positive effect on quality of life for individuals. For example, elderly individuals often struggle with learned helplessness because caregivers may make all decisions for them which can lead to a poor quality of life (Langer, 2014). However, Langer (2014) found that quality of life is improved in some elderly individuals when the tenets of CAM practice are utilized. The positive effect of increasing mindfulness is evidenced by Langer’s longitudinal study with nursing home residents, who were given a plant to care for and then allowed to make recommendations to caregivers about their daily schedule in regards to their health care and social activities (Langer, 2014). These daily practices can be considered CAM based on how residents are active participants in each activity. After a year and a half of completing these daily tasks, the participating residents’ quality of life drastically improved as compared to the residents who did not take care of a plant or participate in daily decision-making about their health. Those participants that engaged in those behaviors reported to be more active, happy, and alert. The mortality rates were much lower in the group that participated in the study as opposed to the group that did not (Langer, 2014). When provided with the opportunity to practice CAM, the nursing home participants experienced perceived control over their health and well-being, which

led to positive effects on their health (Langer, 2014). The participants were encouraged to embrace a more mindful approach to living, which in turn improved the quality of life for the participants (Langer, 2014).

CAM practices such as mindfulness and meditation may affect brain function. “There is evidence that meditation increases activation of the lateral prefrontal cortex” (Marchand, 2013, p. 144). This increased activation of the prefrontal cortex is linked to increased emotional control, leading to reduction in emotional dysregulation (Marchand, 2013). Psychological well-being is improved when ruminating thoughts decrease; this reduction has been linked to mindfulness practices (Marchand, 2013). Marchand’s findings that mindfulness practices improve psychological well-being, support Langer’s (2014) research findings with nursing home participants but may be applied to any population, such as college students. Langer (2014) demonstrated how an individual’s limits are self-imposed. Mindfulness theory proposes that when a person practices mindful behavior their entire self is engaged and their general well-being is improved (Dryden & Still, 2006; Langer & Moldoveanu, 2000b).

The hallmarks of the mindful condition are (a) the ability to view both objects and situations from multiple perspectives, and (b) the ability to shift perspectives depending upon context. Mindful cognition is typically guided by rules and routines but is not governed by them (Carson & Langer, 2006, p. 30). The research of Carson and Langer (2006) is viewed to be a study on thinking; Dryden and Still (2006) proposed that the term mindfulness has similar meaning to words like memory and/or intention. Langer studied how individuals think during their lifespan and theorized that mindfulness plays a role in why elderly people often mirror the thought and behavioral processes of a young

child (Langer & Moldoveanu, 2000a). Langer and Moldoveanu (2000a) suggested that the perception of no control over daily decision-making encourages older adults to no longer care to follow directions that have no meaning for them. A shift in status and power lead to attention problems in the elderly population and can mirror the mindless behaviors of younger adults when they also perceive having no control over decisions (Langer & Moldoveanu, 2000a). Langer refers to an individual choosing not to pay attention as an example of engaging in mindless behaviors (Langer & Moldoveanu, 2000a). Langer (2014) found that assigning the care of a plant and increasing the daily responsibilities of nursing home participants improved quality of life because the participants became more mindful.

Therefore, mindfulness theory assumes that living in the moment and not being concerned about what other people think about you can lead to an improved quality of life. Yet, an individual's quality of life can be negatively impacted by anxiety symptoms. Barrera and Norton (2009) and Westfield et al. (2005) found that individuals who suffer from anxiety symptoms have a poorer quality of life than people who do not suffer from anxiety symptoms. Langer's theory of mindfulness aligns appropriately with examining if CAM—a means of increasing mindfulness—is effective in reducing anxiety in college students. The current study intends to examine if anxiety symptoms of college students decrease after actively participating in their treatment using CAM modalities. Mindfulness theory provides a theoretical framework for the current study by assuming that college students that choose to practice CAM will report a decrease in anxiety symptoms and thus experience a higher quality of life with positive mental health outcomes.

Statement of Purpose

The purpose of the study was to add to the body of knowledge on effective ways to treat college student anxiety symptoms by utilizing CAM practices and applying Ellen Langer's mindfulness theory (Langer & Moldoveanu, 2000a). CAM may be an effective treatment strategy to treat anxiety symptoms often experienced by traditional college students. The current study examined if using CAM practices are effective in helping students decrease state and trait anxiety symptoms.

Research Questions

The study focused on the following research questions:

1. What complementary and alternative medicine modalities are utilized by undergraduate college students?
2. Is there a statistically significant change in reported state anxiety symptoms of undergraduate college students after the utilization of complementary and alternative medicine?
3. Is there a statistically significant change in reported trait anxiety symptoms of undergraduate college students after the utilization of complementary and alternative medicine?

The researcher hypothesized that participants would experience a reduction in state and trait anxiety symptoms when provided with a conducive environment to use CAM modalities.

Potential Significance of the Study

Anxiety is a significant societal problem (APA, 2013). CAM modalities have appeared to be effective in treating college student anxiety in randomized control trials

(Hjeltnes, Binder, Moltu, & Dundas, 2015). However, there is a lack of empirical research supporting both the randomized control trial findings (Hjeltnes et al., 2015) as well as the effectiveness of CAM as a treatment strategy for anxiety. The results of the current study intend to provide empirical evidence that CAM is an effective treatment strategy for college students who are suffering from anxiety symptoms. The methodology of the study intends to serve as a guideline for college campuses to follow in providing accessible and affordable CAM modalities to students who are suffering from anxiety symptoms.

College campuses provide an opportunity for college mental health professionals to address anxiety in young adults, which Hunt and Eisenberg (2010) suggested is one of the biggest public health problems in America. Mental health is the foundation for academic success and the general well-being of college students (Hunt & Eisenberg, 2010). CAM have shown mental health benefits for some college students and may alleviate anxiety symptoms (Hunt & Eisenberg, 2010; Johnson & Blanchard, 2006; Ratansiripong et al., 2012). The current study intends to provide evidence that CAM modalities on college campuses are an effective and affordable response to college student anxiety (Hunt & Eisenberg, 2010).

Access to CAM modalities on college campuses could provide students with an opportunity to treat anxiety symptoms holistically or in combination with other treatment strategies, such as medicine and/or cognitive-behavioral therapy (Ratansiripong et al., 2012). CAM modalities, as an intervention, could potentially serve as a preventative measure for college students who have state and/or trait anxiety. Therefore, learning more about which CAM modalities college students prefer and what CAM modalities reduce

state and trait anxiety symptoms could provide college campuses with a road map in the development of a holistic, effective, and affordable treatment approach for college student anxiety.

Definitions of Terms

Anxiety – a physiological and psychological response to a perceived threat, which affects an individual behaviorally, cognitively, emotionally, and/or physically (Basak & Hansda, 2016; Kang et al., 2009).

Anxiety disorders – characterized as disorders that exhibit features of severe anxiety and excessive fear (APA, 2013; Hooley et al., 2017).

Anxiety symptoms – manifestations of anxiety disorders that include numbness or tingling, feeling hot, feeling shaky, inability to relax, trouble sleeping, a fear that the worst thing possible will happen, feeling dizzy or lightheaded, rapid heartbeat, feeling afraid, nervous, feeling of choking, trembling hands, fear of losing control, difficulty breathing, fear of dying, indigestion, feeling faint or lightheaded, flushed face, and/or hot or cold sweats (Beck et al., 1988).

Cognitive behavior therapy (CBT) – an action-oriented form of psychosocial therapy, CBT assumes that maladaptive or faulty thinking patterns cause maladaptive behavior and “negative” emotions. (Maladaptive behavior is behavior that is counter-productive or interferes with everyday living). The treatment focuses on changing an individual’s thoughts (cognitive patterns) in order to change his or her behavior and emotional state (CBT, 2016).

Complementary and alternative medicine (CAM) – defined by the National Center for Complementary and Alternative Medicine (NCAAM) as “a group of diverse medical

and health care systems, practices, and products that are not presently considered to be a part of conventional medicine” (Bystritsky et al., 2012, p. 266).

Mindfulness – an attempt to describe how one is aware of his or her present without judgment (Haigh et al., 2011). Langer’s definition of mindfulness, which she developed utilizing the framework of cognitive information processing, is this:

[A]s a general style or mode of functioning through which the individual actively engages in reconstructing the environment through creating new categories or distinctions, thus directing attention to new contextual cues that may be consciously controlled or manipulated as appropriate. (Langer, 1989, p. 4)

Psychotropic medications – any medication capable of affecting the mind, emotions, and behavior (ADAA.org, 2016b; Psychotropic medication, 2016). These medications fall under specific categories, such as anti-depressants, anti-anxiety medications, stimulants, anti-psychotic medications, and mood stabilizers. Psychotropic medications can be prescribed; however, illicit drugs, such as cocaine, are also considered a psychotropic medication (Psychotropic medication, 2016).

State Anxiety – how individuals feel presently; considered a temporary condition (Spielberger, 1977).

Trait Anxiety – an individual’s anxiety proneness; considered a long-term condition (Spielberger, 1977).

Chapter Summary

In summary, there are several treatment strategies found to be effective at treating anxiety symptoms in college students. Traditional treatment strategies, such as CBT and psychotropic medication, are effective, but a trained professional is needed to provide the

treatment (Ahmed & Westra, 2009; Hooley et al., 2017; Westra & Dozois, 2006). CAM practices have been found to be effective at treating anxiety symptoms in college students; however, there is a lack of empirical evidence to support this claim (Hjeltnes et al., 2015; Hunt & Eisenberg, 2010; Johnson & Blanchard, 2006; Ratansiripong et al., 2012). Therefore, the purpose of this study is to address significant gaps in the literature of CAM as an effective treatment strategy for college student anxiety symptoms. If colleges are willing to infuse CAM into available resources and make CAM accessible to college students, college students suffering from anxiety symptoms may benefit a great deal. A thorough literature review of effective treatment strategies for college student anxiety is contained in Chapter 2, followed by a detailed plan of the research method in Chapter 3. Chapter 4 includes the results of the current study, and Chapter 5 provides a discussion of the implications of the findings, limitations, and recommendations for future research.

Chapter 2: Review of the Literature

Introduction and Purpose

The purpose of this study was to examine if complementary and alternative medicine (CAM) reduces anxiety symptoms in college students. Many college students across America are struggling to be successful due to debilitating anxiety symptoms. College student anxiety negatively affects academic performance (ACHA, 2016; Beiter et al., 2015; Zivin et al., 2009). According to Grasgreen (2011), at over 400 colleges in the United States in 2010, anxiety was the number one reason college students sought out college counseling centers. Zivin et al. (2009) reported that college student anxiety may have a negative impact on a college student's social, economic, and educational outcomes. Several treatment strategies have been utilized to address anxiety symptoms in the United States, but there has been little research on the effectiveness of these strategies, especially with college students (Westra & Dozois, 2006). CAM could appeal to college students and serve as an affordable and accessible holistic approach to treating anxiety symptoms. Therefore, the study answers the following research questions:

1. What complementary and alternative medicine modalities are utilized by college students?
2. Is there a statistically significant change in reported state anxiety symptoms of college students after the utilization of complementary and alternative medicine?
3. Is there a statistically significant change in trait anxiety symptoms of college

students after the utilization of complementary and alternative medicine?

This literature review is divided into five sections and provides a synopsis of the empirical research completed on CAM as an effective treatment strategy for anxiety. The first section provides an overview of anxiety in higher education, followed by the second section on the impact of anxiety in college students. The third section of the chapter is a review of anxiety treatment strategies for college students. The fourth section includes a methodological review, and the chapter ends with an overview of the gaps in the literature.

Overview of Anxiety in Higher Education Institutions

Anxiety is prevalent in traditional age college students in the United States and is on the rise within this student population (ACHA, 2016; Grasgreen, 2011; Hunt & Eisenberg, 2010). There are several factors contributing to anxiety symptoms amongst the college student population, and there is a need for accessible and affordable treatment approaches in order to combat this public health issue (ACHA, 2016; Basak & Hansda, 2016; Beiter et al., 2015; Zivin et al., 2009). Traditional college age students, between 18 and 24 years old, are at the prime time in the human lifespan for first onset of a mental disorder, with anxiety disorders being one of the most commonly diagnosed during this time (APA, 2013; Beiter et al., 2015; Zivin et al., 2009). If anxiety symptoms are left untreated within the college student population, the symptoms can be prerequisites for developing an anxiety disorder, which in turn can negatively affect a student's social, financial, and academic outcomes (ACHA, 2016; Beiter et al., 2015; Zivin et al., 2009).

The American College Health Association (ACHA, 2016) conducts an annual national survey referred to as the ACHA-National College Health Assessment II (ACHA-

NCHA II). The ACHA (2016) uses the ACHA-NCHA II as an instrument to assist college health professionals in data collection in the area of students' perceptions, habits, and behaviors on prevalent health issues. The ACHA-NCHA II provides the largest comprehensive data set targeting college student health. ACHA-NCHA does not define stress and anxiety in the survey; therefore, it can be inferred that the definitions used by the Anxiety and Depression Association of America (ADAA) can help to distinguish the difference. The ADAA defines stress as a response to a situational threat and defines anxiety to be a reaction to stress (ADAA.org., 2016a). From 2008 until 2016, the ACHA-NCHA II findings list stress and anxiety to be the two most prominent health issues negatively affecting academic success for college students. These results are an indication of a growing concern among health professionals because stress has been found to increase the likelihood that an individual will experience anxiety symptoms (Hughes, 2007).

In 2008, the ACHA-NCHA II found that 18.2% of American college students identified anxiety to be impeding their ability to be successful academically, and 27.2% indicated experiencing stress. In 2016, the ACHA-NCHA II found that 24.4% of American college students identified anxiety to be negatively affecting their academic performance, while 33.8% indicated stress. The ACHA-NCHA II findings, shown in Table 2.1, indicate that both stress and anxiety increased between 2008 and 2016 (ACHA, 2016). In addition to the ACHA-NCHA II (2016) findings, other studies examined the prevalence of college student anxiety in the United States (Beiter et al., 2015; Zivin et al., 2009).

Table 2.1

Percentage of College Students Experiencing Stress and Anxiety in 2008 and 2016

American College Students	2008	2016
Students identifying anxiety impeding ability	18.2%	24.4%
Students experiencing stress	27.2%	33.8%

Beiter et al. (2015) conducted a quantitative study to examine the prevalence of a variety of mental illnesses in undergraduate students between the ages of 18 and 24 years. Participants in Beiter et al.'s (2015) study completed the Depression, Anxiety, and Stress Scale 21 (DASS 21) and an additional survey with questions about common college stressors. The DASS 21 defines the anxiety scale as a measurement of psychological arousal symptoms, and the stress scale measures the subjective cognitive symptoms of anxiety (Lovibond & Lovibond, 1995). Beiter et al. (2015) found that participants reported their stress levels to be moderate or severe in the areas of academic performance, post-graduation plans, pressure to succeed, financial stress, sleep issues, interpersonal relationships with friends and family, and concerns surrounding self-esteem, body image, and general health. The self-reported anxiety scores of upperclassman were significantly higher compared to freshman ($p < .05$) and commuters had higher anxiety scores than students who lived in residence halls (Beiter et al., 2015). Transfer college students reported significantly higher anxiety scores than non-transfer students ($p \leq .01$), and females had higher anxiety scores than males ($p < .05$). Beiter et al. (2015) found that body image ($p < .05$) and sleep issues were the most common reasons for feeling stressed by participants in the study.

The findings from Beiter et al. (2015) suggest that colleges may need to provide targeted initiatives for alleviating stress and anxiety that reach all students. CAM may be such an initiative as it has been effective in treating anxiety symptoms, is affordable, and is easier to access than traditional counseling or medication (Henriques et al., 2011; Ratansiripong et al., 2012). The current study was intended to increase student awareness of CAM modalities on campus as a treatment strategy for anxiety of all enrolled students.

Similar to Beiter et al. (2015), Zivin et al. (2009) also found several factors contributed to a college student's anxiety symptoms. Zivin et al. (2009) conducted a longitudinal quantitative study at a large public university to provide data examining the correlation between the high prevalence of mental health issues in college students and their help-seeking behaviors. Additionally, Zivin et al. (2009) examined how the prevalence of these issues influenced a student's ability to seek out help. Zivin et al. (2009) collected survey data from students in 2005 and again in 2007, resulting in a sample ($N = 786$) of college students. Zivin et al. (2009) used the Patient Health Questionnaire to measure college student depression and anxiety.

Zivin et al. (2009) found that participants developed anxiety over the 2-year reporting period, and almost half of the students who had anxiety in 2005 still reported suffering from anxiety in 2007. The results also showed that eating disorders and suicidal ideation in 2005 were significant predictors of anxiety disorders in 2007 (Zivin et al., 2009). The results of Zivin et al. (2009) also found that having a mental health issue in the initial survey in 2005 was a predictor of having a mental health issue in 2007. Zivin et al.'s (2015) findings that mental health problems persist over a 2-year period of time suggests that mental health issues, such as anxiety, are not just due to adjusting to

college, these findings demonstrate that mental health issues can persist over time for several college students. Additionally, Zivin et al.'s (2009) findings reflect a high degree of persistence in lack of perceived need for help as well as in a lack of use in services. During the 2-year data collection period, out of the participants who were identified as having a probable mental health disorder at the initial screening, only 39% perceived a need for help by the 2-year follow-up screening.

The findings of Zivin et al. (2009) support the suppositions of Beiter et al. (2015) that there are college students dealing with mental health issues, such as anxiety, that are separate from adjusting to the stressors of college. The American Psychiatric Association (APA, 2013) states that if symptoms persist for more than a 6-month period, then the issue is not due to adjustment. Zivin et al.'s (2009) longitudinal study found that more than half of the participants that reported experiencing anxiety symptoms in 2005 were still experiencing anxiety symptoms in 2007, which rules out that adjustment to college was the cause of their anxiety symptoms. Zivin et al. (2009) also found that the majority (61%) of the participants perceived no need for treatment at baseline and at follow-up, even though the initial screening identified a probable mental health disorder at baseline. In Beiter et al.'s (2015) study, upperclassmen had significantly higher anxiety scores than underclassmen, again indicating that the anxiety experienced was separate from adjusting to college. Beiter et al. (2015) and Zivin et al. (2009) both recommend the need for on-campus initiatives to treat anxiety, because long-term college student anxiety symptoms are prevalent, and often for reasons other than the stress that comes from adjusting to college. Effective treatment strategies on college campuses are recommended because

anxiety symptoms often manifest into anxiety disorders with long-term negative consequences (APA, 2013).

Many college campuses have “limited resources and a growing demand for student mental health services” (Zivin et al., 2009, p. 184). Current resources include on-campus counselors trained in techniques such as CBT or MBCT, as well as a medical provider on campus that can prescribe psychotropic medications, which can be expensive and are only available to students during certain hours (Henriques et al., 2011; Ratansiripong et al., 2012). Learning more about the effectiveness of CAM practices to treat anxiety symptoms experienced by college students could provide additional, cost-effective mental health services to meet this growing demand.

Impact of Anxiety in College Students

Several studies examined the impact anxiety symptoms have on the quality of life for college students who suffer from pervasive trait anxiety symptoms (Barrera & Norton, 2009; Beiter et al., 2015; Spielberger, 1975; Westfield et al., 2005). Trait anxiety symptoms are often diagnosed as an anxiety disorder due to the severity and amount of time students have experienced the symptoms (Barrera & Norton, 2009; Beiter et al., 2015; Spielberger, 1975; Westfield et al., 2005). A large percentage of college students may be at risk for poor academic and social performance due to an inability to balance responsibilities while battling anxiety symptoms (Barrera & Norton, 2009).

Barrera and Norton (2009) conducted a quantitative study examining the impact anxiety disorders have on a college student’s quality of life compared to non-anxious individuals in the community. The study was conducted at a university’s anxiety disorder clinic where all the college student participants ($N = 77$) had an anxiety disorder

diagnosis. Participants completed a quality of life inventory and the Anxiety Disorders Interview Schedule for DSM-IV (ADIS IV), which included a Clinician Severity Rating to determine the level of severity differences between the anxiety disorders the participants had. Barrera and Norton (2009) found the quality of life for individuals with anxiety disorders is significantly lower ($p = .0001$) than the quality of life experienced by individuals in the general population who were non-anxious.

In addition to a poor quality of life, some college students suffering with anxiety symptoms or disorders are at risk for depression and suicide attempts. Westfield et al. (2005) conducted a quantitative study and collected data from four universities with a survey, which asked generic questions about suicide. Westfield et al. (2005) examined generalizable data about college student suicide as opposed to examining trends within the universities or comparing the four institutions of higher education where data was collected. The participants consisted of $N = 1,865$ students from four universities in the United States. Westfield et al. (2005) distributed surveys to several college classes during the academic year that included questions addressing several suicide-related issues, including participants' own experience with suicide, if participants felt suicide was a general problem for college students, what they knew about campus resources, and other open-ended questions. The participants in the Westfield et al. (2005) study who indicated a past suicide attempt provided several reasons for attempting to end their lives, such as stress related to school, trouble with relationships, family problems, depression, and hopelessness. However, anxiety was reported by 92% of the participants as the reason they attempted suicide. These findings indicate that anxiety could be a main contributor to why some college students choose to end their life (Westfield et al. (2004).

Westfield et al. (2005) and Barrera and Norton (2009) found suicide attempts and decreased quality of life in college students can be a result of anxiety. The current study investigated the use of CAM as a potential strategy to treat college student anxiety. Additionally, this study may provide an alternative treatment option for college students to reduce anxiety symptoms, which in turn, may improve the quality of life for the participants.

Anxiety Treatment Strategies for College Students

The current study suggests that an effective treatment strategy for college student anxiety can be defined as a technique implemented to reduce state and trait anxiety symptoms in college students. Several treatment strategies have been utilized to address anxiety symptoms in the United States, but there has been little research on the effectiveness of these strategies (Nowak et al., 2015; Oman et al., 2008; Ratansiripong et al., 2012; Westra & Dozois, 2006). This section focuses on the empirical research of therapeutic strategies for treating college student anxiety. The review will examine the effectiveness of cognitive behavioral therapy (CBT), psychotropic medication, mindfulness-based cognitive therapy (MBCT), and CAM as strategies to reduce anxiety symptoms in college students.

Cognitive behavioral therapy (CBT). CBT is a popular approach in treating anxiety disorders in the United States and is considered by many mental health professionals to be the gold standard for treating anxiety symptoms (Olatunji, Cisler, & Deacon, 2010; Westra & Dozois, 2006). Several studies examined the impact CBT had on treating anxiety symptoms utilizing a pretreatment rationale before administering CBT (Ahmed & Westra, 2008; Kaufman & Baucom, 2014; Westra & Dozois, 2006). A

pretreatment rationale is utilizing a form of psychotherapy before using CBT in order to decrease both an individual's resistance to treatment and ambivalence about change before utilizing CBT (Westra & Dozois, 2006). Several studies found that pretreatment rationales do increase CBT's effectiveness in reducing anxiety symptoms (Ahmed & Westra, 2008; Kaufman & Baucom, 2014; Olatunji et al., 2010; Westra & Dozois, 2006).

Kaufman and Baucom (2014) and Ahmed and Westra (2008) found that CBT is an effective strategy in treating college student anxiety symptoms. However, students must be motivated, patient with the process and willing to make changes in thought and behavior (Ahmed & Westra, 2008; Kaufman & Baucom, 2014). Additionally, in order to receive CBT treatment, college students have to meet with a trained mental health therapist, which is a time commitment and, on some campuses, a financial burden (Henriques et al., 2011).

Psychotropic medication. Studies have examined the efficacy of psychotropic medication for the treatment of anxiety with mixed results, namely, that psychotropic medication is effective but has serious side effects (Bandelow et al., 2015; Stone & Merlo, 2011). Bandelow et al. (2015) conducted a meta-analysis and reviewed 234 studies, involving a sample of ($N = 37,333$) patients, comparing the efficacy of psychotherapies to psychotropic medications when treating individuals with agoraphobia (PDA), generalized anxiety disorder (GAD), or social anxiety disorder (SAD). Bandelow et al. (2015) calculated both pre/post and treated versus control effect sizes for all quantifiable randomized-controlled studies and found statistically significant evidence ($p < .05$) that psychotropic medications were superior to all psychotherapies, including CBT, in reducing anxiety symptoms when participants suffered from PDA, GAD, or

SAD. Bandelow et al. (2015) found that the reduction in symptoms took place more quickly with psychotropic medication than with psychotherapies. However, psychotropic medications may have negative side effects for college students and some can be addictive leading to dependency issues (Bandelow et al., 2015).

Stone and Merlo (2011) found similar results as Bandelow et al. (2015) in that both studies reported psychotropic medications used to treat anxiety symptoms or disorders have drawbacks. Stone and Merlo (2011) examined the misuse of prescription medications by college students ($N = 383$) using self-reporting questionnaires to collect data over a 10-month period. Stone and Merlo (2011) found that students with prescriptions for psychiatric drugs were more likely to misuse their medication based on the class of medication. For example, 57.1% of college students that reported to be stimulant misusers indicated misusing the medication to assist with academics, whereas 33.3% of the benzodiazepine misusers indicated the primary reason for misuse was to party or get high (Stone & Merlo, 2011). This misuse is one of the greatest dangers of using psychotropic medication to treat anxiety symptoms (Stone & Merlo, 2011).

Bandelow et al. (2015) found that psychotropic medications are effective in reducing anxiety symptoms; however, the use of such medication contributed to other societal issues such as addiction and illegal behavior (Stone & Merlo, 2011).

Psychotropic medications are intended for individuals who are experiencing anxiety symptoms, but not all people experiencing anxiety symptoms meet the criteria for an anxiety disorder (Stone & Merlo, 2011). College students may be prescribed psychotropic medication regardless a diagnosis of anxiety, and misuse of psychotropic medication amongst the college student population is prevalent (Tai, Casher, & Bostwick,

2015). Also, medication like CBT can be a financial burden and requires patients to have access to a professional provider (Stone & Merlo, 2011).

Mindfulness-based cognitive therapy (MBCT). MBCT was originally designed to assist people who suffer from persistent depressive symptoms. However, it has also emerged as a treatment strategy for anxiety disorders (Marchand, 2013; Xie, Zhou, Gong, Iennaco, & Ding, 2014). MBCT is a combination of cognitive therapy and meditative practices constructed from the acquirement of mindfulness (Marchand, 2013; Xie et al., 2014). Zindel Segal, Mark Williams, and John Teasdale developed MBCT utilizing Jon Kabat-Zinn's Mindfulness-Based Stress Reduction program (MBSR) as a compass for their therapy approach (Marchand, 2013). "MBSR involves the cultivation of several attitudes, including becoming an impartial witness to one's own experience and acceptance of things as they actually are in the present moment" (Marchand, 2014, p. 142). MBCT is rooted in MBSR and combines elements of CBT and mindfulness techniques (Marchand, 2013; Xie et al., 2014).

Xie et al. (2014) found that MBCT is an effective treatment strategy for reducing anxiety symptoms. MBCT can be administered over the course of eight sessions tailored to treat specific cases (Xie et al., 2014). The goal of MBCT is to reduce negative emotions while increasing positive ones and assist individuals with determining life goals, which in turn has been found to reduce anxiety symptoms (Xie et al., 2014). To reduce depressive and anxiety symptoms, individuals learn skills over eight sessions to recognize when their mood is decompensating so that they can disengage from self-inflicted rumination of negative thinking (Xie et al., 2014). As an individual becomes more aware of their thoughts and feelings, or becomes more mindful, this awareness

reduces anxiety symptoms (Marchand, 2013). Mindfulness is considered a form of meditation, and meditation is considered CAM (Marchand, 2013).

The purpose of Regehr, Glancy, and Pitts (2013) research was to add to the body of knowledge on effective strategies to address the concerning rates of depression and anxiety among college students, who are not receiving treatment from college wellness centers. Regehr et al. (2013) conducted a meta-analysis that examined 24 studies with a sample of ($N = 1,431$) college students, and found that behavioral, cognitive, and mindfulness strategies are all effective in decreasing stress in college students, as well as reducing anxiety and depression symptoms. Regehr et al.'s (2013) results indicated statistically significant findings that mindfulness-based approaches, as well as cognitive and behavioral approaches, reduce college student anxiety symptoms (Regehr et al., 2013). Regehr et al. (2013) did not report findings that one treatment strategy was more effective than another, in reducing anxiety symptoms of college students.

The Regehr et al. (2013) findings encouraged colleges to develop widely accessible programs for students aimed at stress reduction. MBCT has been found to be an effective treatment strategy for college student anxiety (Xie et al., 2014); however, similar to other traditional forms of treatment, MBCT requires students to meet with a trained professional and a time commitment of eight sessions in order to experience relief from anxiety symptoms (Xie et al., 2014). Access to such a professional and the cost of the sessions may present barriers for students (Henriques et al., 2011; Ratansiripong et al., 2012; Xie et al., 2014). This study was an examination of a current college program that involved relaxation rooms built to assist students with stress reduction; thus, the

current study adds to the literature on how mindfulness interventions in the form of CAM alter a college student's anxiety symptoms.

Complementary and alternative medicine (CAM). While CAM has been growing in usage over the last 20 years as a popular treatment strategy for anxiety disorders, it is still considered understudied among college students who experience anxiety symptoms (LaCaille & Kuvaas, 2011). Several studies examined college student CAM usage, specifically focusing on the reasons college students use CAM practices (LaCaille & Kuvaas, 2011; Mhatre et al., 2011; Nowak et al., 2015; Synovitz et al., 2006). Mhatre et al. (2011) found that the college student population might prefer CAM to other traditional models of treatment strategies because it is unorthodox and may better align with their personal belief system and lifestyle. Mhatre et al. (2011) contributed the spike of CAM usage to familial lineage, meaning parents and grandparents may be CAM users.

A systematic literature review was conducted by Bishop et al. (2007) to examine beliefs involved in the use of CAM. Bishop et al.'s (2007) study consisted of a database search wherein a sample ($N = 94$) of empirical journal articles were reviewed to determine why individuals use CAM. None of the articles reviewed by Bishop et al. (2007) were specific to college students; however, articles were selected that examined adult CAM use. Control and participation seem to be key elements to the popularity of CAM. Bishop et al. (2007) uses the term control to explain individuals who use CAM because they have personal control as opposed to a provider having control over their health. Participation refers to individual's having an active role in treatment decisions as opposed to non-users of CAM (Bishop et al., 2007). The studies Bishop et al. (2007)

reviewed found that users of CAM need to buy in and believe they are capable of self-managing their chronic illnesses. Additionally, Bishop et al. (2007) found that individuals that use CAM need to be active participants in, and take ownership of, their treatment. If CAM users can achieve this level of participation and ownership, they feel empowered and gain a sense of control over their illness (Bishop et al., 2007).

Some college students want to feel in control of their health and well-being (LaCaille & Kuvaas, 2011). The quantitative study performed by LaCaille and Kuvaas (2011) examined college student use of CAM and herbal supplements in a sample ($N = 370$) of undergraduate students at an American college (LaCaille & Kuvaas, 2011). Participants were asked to complete a CAM Survey, in order to rate the frequency of their usage of 21 different types of CAM and herbal supplements over the past year, selecting either monthly, weekly, or daily (LaCaille & Kuvaas, 2011). The results of the CAM survey indicated that 77.8% used at least one form of CAM during the previous year (LaCaille & Kuvaas, 2011). LaCaille and Kuvaas (2011) found that massage therapy, relaxation techniques (i.e., meditation and guided imagery), yoga, chiropractic care, and aromatherapy were the four most frequently used CAM practices by the participants. The current study examined college student CAM use and enjoyment and included two of the four CAM practices most used in LaCaille and Kuvaas's (2011) study, which are massage and aromatherapy. The current study expands LaCaille and Kuvaas's (2011) research by examining which CAM modalities college students enjoy the most.

American college students seem to support CAM practices and/or herbal supplements and engage in them regularly (LaCaille & Kuvaas, 2011). When utilized properly, CAM practices can be an effective treatment strategy to help college students

reduce and treat anxiety disorder symptoms. The major cause for concern and potential drawback is the use of herbal supplements by college students (LaCaille & Kuvaas, 2011). If college campuses plan to offer herbal supplements as a way to reduce anxiety symptoms, education and monitoring would be essential because using or mixing herbal supplements could harm instead of improve an individual's mental and physical health (LaCaille & Kuvaas, 2011).

Similar to LaCaille and Kuvaas (2011), Nowak et al. (2015) also examined the usage of CAM practices amongst college students. Utilizing Bandura's social cognitive theory (SCT) as a theoretical framework, Nowak et al. (2015) were interested in determining if a student's choice to utilize CAM practices was related to personal choice and/or environmental influences. The study was conducted at a large American university and involved a sample ($N = 2,553$) of college students (Nowak et al., 2015). Nowak et al. (2015) found that 82% of the college students reported using CAM practices at least once over the course of the year. Nowak et al.'s (2015) findings that CAM usage is still popular amongst college students may strengthen LaCaille and Kuvaas's (2011) recommendations that students would benefit from having professionals in a college health and counseling center who are well versed in CAM practices and supportive of the student's treatment of choice. Nowak et al. (2015) focused on prevalence of CAM usage rather than specific reasons for or frequency of CAM usage. The current study provided students with the opportunity to self-select preferred CAM modalities to use in a one-hour period and assessed with a pretest-posttest design the effect the CAM modalities selected have on the participant's state and trait anxiety symptoms.

Research was conducted by Synovitz et al. (2006) at a mid-size American university to identify what CAM practices college students were aware of and used in order to determine the perception college students have about alternative practitioners and medical doctors. Unlike previous studies, Synovitz et al. (2006) found that 52.7% of the participants reported having knowledge of CAM practices, with 50% reporting indicating they used CAM practices at least once in the last year. In order of usage, participants reported massage to be the most used, then herbal supplements, yoga, aromatherapy, meditation, and chiropractic care. Synovitz et al. (2006) found that participants' CAM usage was not indicative of a replacement to conventional medicine but rather a complement to these kinds of traditional medical model treatments. The results also indicated that participants found CAM providers more approachable and receptive but found medical doctors more competent about disease and explanations of sickness (Synovitz et al., 2006). Participants that reported having anxiety/nervousness/stress ($p = .05$) were found to have a significant positive attitude toward CAM providers (Synovitz et al., 2006). Participants may seek out CAM services for ailments that over the counter medication can treat (Synovitz et al., 2006). Synovitz et al.'s (2006) results revealed that having anxiety is one of the predictors of herbal supplement use within the college student population. Synovitz et al. (2006) connected demographic information to CAM usage, through a survey. The current study also used a demographic survey to determine if demographic characteristics such as gender, race, academic year, residential status, transfer student status, and/or GPA play a role in a college student's choice of CAM when given the opportunity to self-select what CAM modality to use.

LaCaille and Kuvaas (2011), Nowak et al. (2015), and Synovitz et al. (2006) examined why college students use CAM and found CAM to be an effective treatment strategy for treating anxiety symptoms. LaCaille and Kuvaas (2011), Nowak et al. (2015), and Synovitz et al. (2006) also found that college students using CAM did not see it as a replacement for traditional medicine but as a practice that complements traditional treatment strategies. The current study expands on these findings by examining if CAM practices, experienced as a standalone treatment strategy, on a college campus are effective at treating college student anxiety symptoms.

The purpose of a quantitative study conducted by Johnson and Blanchard (2006) was to examine the predictors of alternative medicine and herbal supplement usage of undergraduate college students ($N = 506$). Johnson and Blanchard (2006) use the terms alternative medicine and CAM interchangeably. Participants completed an alternative medicine survey, herbal questionnaire, the Modern Health Worries (MHW) scale, the Subjective Health Complaints scale, and the Positive and Negative Affect Schedule (PANAS). The MHW scale examines participant concerns regarding a variety of aspects on health, such as genetically modified food and the depletion of the ozone layer (Johnson & Blanchard, 2006). The Subjective Health Complaints scale 11 involves asking participants how often they have experienced 28 symptoms over the last month, ranging from 1, not at all, to 4, serious.

Based on the analysis of the survey results, Johnson and Blanchard (2006) found that 58% of the participants indicated they had used CAM at least once throughout the year. Johnson and Blanchard (2006) found that massage, aromatherapy, yoga, and relaxation were reported as the most popular CAM modalities. Additionally, 79% of

participants reported herbal supplement use, with the most frequent reported usage of green tea, ginseng, chamomile, ginger, and echinacea (Johnson & Blanchard, 2006). Herbal use was closely related to participants' musculoskeletal, pseudoneurological, and gastrointestinal issues. Johnson and Blanchard (2006) used a hierarchical regression model to determine predictors of CAM use and found statistically significant demographic factors, such as increased age ($p = .02$) and female gender ($p = .003$), serve as predictors for CAM use. Subjective factors such as the flu-like symptoms ($p = .04$), musculoskeletal symptoms ($p = .004$), and pseudoneurological symptoms ($p = .02$) significantly predicted CAM use (Johnson & Blanchard, 2006). Additionally, Johnson and Blanchard (2006) conducted a hierarchical regression model and determined that the MHW items associated with modern or technological features of daily life (e.g., air pollution, x-rays, food additives, etc.), were statistically significant ($p = .01$) predictors of college student CAM use.

Johnson and Blanchard's (2006) findings are important to this study because their results support that many college students are using CAM modalities. However, Johnson and Blanchard's (2006) results did not indicate why college students are using CAM. Johnson and Blanchard (2006) imply that college students may be more open to new approaches to health care, and that college students may be using CAM to treat anxiety symptoms. Similar to Johnson and Blanchard (2006), this study examined what CAM modalities are utilized by college students but also if CAM usage caused a change in reported anxiety symptoms.

Biofeedback. Biofeedback is a CAM practice that enables users to change physiological activity for increased health and performance benefits (Ratanasiripong et

al., 2012). Biofeedback allows users to become more self-aware and provides an opportunity to learn how to better control physiological responses (Ratanasiripong et al., 2012). Users are then encouraged to apply the learned control in everyday life (Ratanasiripong et al., 2012). Many college students utilize traditional treatment approaches to address their anxiety symptoms. However, emerging research suggests that CAM practices, such as biofeedback, combined with traditional counseling may improve reduction of anxiety symptoms (Ratanasiripong et al., 2012).

Ratanasiripong et al. (2012) examined if an alternative treatment model (i.e., traditional counseling and biofeedback combined) would yield better results than traditional counseling alone offered at college counseling centers. Ratanasiripong et al.'s (2012) study involved participants who were all clients at the counseling center on campus. All participants completed the Beck Anxiety Inventory (BAI) because of its "validity and wide usage with the counseling client population as well as the diverse college student population" (Ratanasiripong et al., 2012, p. 744). The participants in Ratanasiripong et al.'s (2012) study were randomly assigned to the treatment group, who received 4 weeks of individual counseling with four 30-minute sessions of biofeedback, and to the control group, who only received 4 weeks of individual counseling.

After the 4 weeks, participants met with the researchers for a post-study debriefing session and completed the post-treatment BAI within the week after their last counseling session. Both the treatment and the control group showed a significant reduction ($p = .01$ for both treatment and control groups) in anxiety symptoms. The mean BAI for the treatment group decreased from pretreatment ($M = 24.13$) to post-treatment ($M = 10.53$). The mean BAI for the control group decreased from pretreatment ($M =$

19.80) to post-treatment ($M = 13.13$). Ratansiripong et al. (2012) found that the combination of traditional counseling and biofeedback led to a significant decrease in anxiety levels. These results indicate that combining biofeedback with traditional counseling reduces anxiety for some individuals at a greater rate than utilizing traditional counseling alone (Ratansiripong et al., 2012). The current study also examined whether biofeedback and other CAM modalities reduce anxiety symptoms. However, Ratansiripong et al. (2012) highlighted that a trained professional conducted the counseling sessions; the current study examines whether students can reduce anxiety symptoms as a standalone treatment and without the assistance of a trained professional.

Another standalone treatment for anxiety could be a computer-based heart rate variability (HRV), a self-directed biofeedback CAM modality. Henriques et al. (2011) was interested in learning how to reduce stress levels of college students through the use of HRV. To examine HRV effectiveness in reducing college student anxiety, Henriques et al. (2011) conducted two experimental studies in order to determine if the results would be replicated. The first study conducted by Henriques et al. (2011) was a pilot project involving a sample of students who received HRV treatment for 4 weeks. The participants were asked to complete the Mood and Anxiety Symptoms Questionnaire (MASQ) and the State Trait Anxiety Inventory (STAI) (Henriques et al., 2011) one week after completion of HRV treatment. Data analysis found that state and trait anxiety scores at baseline and one week after completion indicated that HRV treatment was significantly effective ($p = .019$) at reducing anxiety symptoms. Participants experienced a statistically significant reduction in state ($p = .019$) and trait ($p = .032$) anxiety symptoms over the 4-week period (Henriques et al., 2011).

To determine if the results of the pilot project would be replicated, Henriques et al. (2011) conducted a follow-up study with an immediate versus delayed research design. A new sample of students was divided into two groups (Henriques et al., 2011). One group received the biofeedback immediately for 4 weeks; the second received biofeedback after the first group had completed 4 weeks of biofeedback (Henriques et al., 2011). Significant differences (ranging from $p = .001$ to $p = .003$) were found across time for 4 of the 6 MASQ subscales (Henriques et al., 2011). Compatible biofeedback software and the same assessment tools were used for both the pilot study and the second study (Henriques et al., 2011). The results of both the pilot and follow-up studies by Henriques et al. (2011) found biofeedback reduced anxiety symptoms, which supports this study's hypothesis that biofeedback and other forms of CAM are effective treatment strategies to reduce college student anxiety.

Meditation. Empirical research has added to the body of literature on meditation as a CAM practice for reducing college student anxiety (Oman et al., 2008). Oman et al. (2008) conducted an experimental quantitative study with the purpose of determining if two meditation management of stress (MMS) strategies affected the well-being and stress levels of college students (Oman et al., 2008). The study by Oman et al. (2008) consisted of 44 students between the ages of 18 and 24 randomly assigned to three groups: one group used a modification of Kabat-Zinn's mindfulness-based stress reduction (MBSR), the second used Easwaran's Eight-Point Program (EPP), and the third as the control group used no MMS. Oman et al. (2008) chose MBSR and EPP because of their similarities in intent and design and hypothesized that MBSR and EPP would produce similar outcomes. Each MMS management treatment took place in eight, 90-minute,

weekly sessions. All participants, including those in the control group, completed a pretest, posttest, and an eight-week follow up.

The results of Oman et al.'s (2008) study found no significant difference between the MBSR and EPP groups. However, compared to the control group, both the MBSR group and the EPP group showed significant decreases in perceived stress ($p < .05$) at pretest and at posttest ($p = .0995$). At the eight-week follow up, the MBSR group and the EPP group data indicated that the treatment provided an advantage over the control group that received no treatment. The findings of Oman et al. (2008) support that meditation programs can reduce stress levels in some college students. The current study expanded on this finding and measured if CAM modalities, such as biofeedback, aromatherapy, massage, meditation, etc., alter reported anxiety symptoms in college students.

Mindfulness. Mindfulness-based stress reduction (MBSR) programs are another form of CAM practices (Caldwell et al., 2011). Health benefits have been linked to increased levels of mindfulness (Caldwell et al., 2011). Caldwell et al. (2011) conducted a longitudinal study of college students ($N = 208$) in order to examine the relationship between students enrolled two different college courses. The students in the experimental group were enrolled in the *taijiquan* course, which according to Caldwell et al. (2011) is a mind-body exercise originating in China as a form of martial arts that involves breathing techniques to improve focus and concentration. The control group was enrolled in special recreation that was comparable to taijiquan in social interaction and physical movement but lacked the mind-body awareness training. As part of their class, participants completed a survey at the beginning, in the middle, and at the end of the semester. The two groups in Caldwell et al.'s (2011) study were demographically

comparable, which allowed for control over confounding factors, such as duration of study, instructor attentiveness, and expectations of in-class and out-of-class time. Caldwell et al. (2011) recorded the baseline group differences and unlike the control group, the experimental group reported significant decreases in tiredness, perceived stress, negative energy, sleep disturbance and significant increases in relaxation, positive energy, and self-regulatory efficacy, with all p values equaling $< .001$. Caldwell et al. (2011) found taiji to be an effective mind-body intervention to improve mood and reduce anxiety symptoms (Caldwell et al., 2011). The current study intends to examine if anxiety symptoms in college students can be reduced with other forms of CAM practices, such as massage chairs, aromatherapy, biofeedback, audio library, multi-spectrum lamp, and a face massager.

In summary, several studies have examined CAM usage and found CAM to be an effective approach to reducing anxiety symptoms (Caldwell et al., 2011; Henriques et al., 2011; LaCaille & Kuvaas, 2011; Nowak et al., 2015; Oman et al., 2008; Synovitz et al., 2006). Significant gaps in the research remain, such as what CAM modalities college students prefer to use and what CAM modalities, in addition to biofeedback (Henriques et al., 2011), are effective as a standalone treatment strategy to reduce anxiety symptoms for college students. To address this research gap, the current study utilized six CAM practices for students to self-select from in order to gather data on whether CAM usage reduced student anxiety symptoms and what CAM modalities participants preferred.

Methodological Review

Empirical research was reviewed in this chapter for cognitive behavior therapy (CBT), psychotropic medication, mindfulness-based cognitive therapy (MBCT), and

CAM as treatment strategies for college student anxiety symptoms as well as anxiety disorders. This review of the research highlighted advantages and disadvantages of the different treatment strategies. Most of studies reviewed in this chapter used predominately quantitative methods to examine anxiety in college students (Ahmed & Westra, 2008; Barrera & Norton, 2009; Beiter et al., 2014; Caldwell et al., 2008; Henriques et al., 2011; Johnson & Blanchard, 2006; LaCaille & Kuvaas, 2011; Liu et al., 2014; Nowak et al., 2015; Oman et al., 2008; Ratanasiripong et al., 2012; Synovitz et al., 2006; Westfield et al., 2005; Westra & Dozois, 2006; Zivin et al., 2008). Quantitative methods have been used extensively to research CBT and CAM effectiveness in treating anxiety disorders. Several studies reviewed in this chapter were experimental designs where participants were assigned to experimental groups through random or convenience sampling (Henriques et al., 2011; Nowak et al., 2015; Oman et al., 2008; Ratanasiripong et al., 2012; Westra & Dozois, 2006). Caldwell et al. (2011) used a quasi-experimental design with repeated measures. Westra and Dozois (2006) used a pretreatment rationale design, where the groups were determined by separating those who had received pretreatment from those who had received no treatment before receiving cognitive behavioral therapy in a group setting. Longitudinal and cross-sectional studies (Mhatre et al., 2011; Zivin et al., 2009) were observational, with data collection taking place at a determined time. Self-reports, surveys, and questionnaires were utilized to collect data in the studies reviewed in this chapter, but there was not a consistent instrument used to measure anxiety. In the only qualitative study referenced in this literature review, Kaufman and Baucom (2014) used a case study to outline the participants' experience with cognitive behavioral therapy as a treatment strategy for anxiety.

Chapter Summary

Seven out of 10 adults in the United States are suffering from anxiety symptoms on a daily basis (Beiter et al., 2015). Across the nation, college student mental health is plummeting (Cook, 2007). While depression is a contributing factor to this epidemic, anxiety is significantly negatively affecting the lives of college students (Ahmed & Westra, 2009). Cognitive behavior therapy (CBT), psychotropic medication, mindfulness-based cognitive therapy (MBCT), and CAM have been utilized as treatment strategies for anxiety, but each treatment's efficacy in treating college students varies. Empirical research supports the use of CBT, psychotropic medication, and MBCT to treat anxiety, but recovery and compliance rates within the college student population may be negatively impacted by the presence of three barriers: necessity of a mental health clinician, sufficient financial resources to pay for counseling services, and the stigma associated with these traditional forms of treatment (Ratansiripong et al., 2012; Westra & Dozois, 2006). In addition, there are growing concerns about the misuse of psychiatric medications within the college student population (Bandelow et al., 2015; Stone & Merlo, 2011).

Several studies support the need for colleges to make CAM practices more readily available to college students (Caldwell et al., 2011; Johnson & Blanchard, 2006; LaCaille & Kuvaas, 2011; Oman et al., 2008; Ratansiripong et al., 2012; Synovitz et al., 2006). These studies also found that participants had been utilizing CAM before the studies as a healthier alternative to manage health issues and anxiety symptoms. The prevalence of anxiety among college students and examining the persistence of mental health needs of college students was a recurring theme in the majority of the articles reviewed.

Empirical research on CAM strategies for effective treatment of anxiety suggests that college students seek out and use CAM practices as a way to better manage their anxiety symptoms (LaCaille & Kuvaas, 2011). After the passage of the Patient Protection and Affordable Care Act in 2010, which requires that insurance companies not discriminate against licensed medical providers utilizing CAM strategies, Nowak et al. (2015) predicted that CAM usage would continue to increase. This Act provides access to CAM practices as an effective treatment strategy for anxiety. Chapter 3 provides an overview of the methodology, participants, data collection, and data analysis for the current study.

Chapter 3: Research Design Methodology

Introduction

College student anxiety is a significant mental health burden which, if left untreated, may lead to illness, stress, sleep disturbance, depression, rumination, isolation or avoidance, anxiety disorder, and suicide (Bamber & Schneider, 2016; Oman et al., 2012; Ratansiripong et al., 2012). Additionally, traditional age college students, ages 18 to 24, are at high risk for developing anxiety disorders due to their age, lifestyle, and prolonged academic and social stressors (Hunt & Eisenberg, 2010). College student anxiety has been documented as an issue for colleges and universities in the areas of retention and persistence to graduation (Bamber & Schneider, 2016). The American College Health Association (ACHA, 2016) found anxiety to be a contributing factor impeding the academic success of college students. Additionally, anxiety is a financial and an emotional burden for students, impeding their ability to be successful both academically and socially (Bamber & Schneider, 2016; Zivin et al., 2009). Consequently, learning more about effective treatment strategies could benefit college students suffering from state and trait anxiety symptoms.

The need for further research on the effectiveness of CAM for the treatment of anxiety symptoms in college students has been addressed in previous research (Liu et al., 2014; Mhatre et al., 2011; Ratansiripong et al., 2012; Synovitz et al., 2006). Ratansiripong et al. (2012) reported there is a lack of research on how effective CAM is

at treating anxiety symptoms in the college student population. The current study addressed this gap in the literature by investigating what CAM modalities college students prefer and if CAM modalities are an effective treatment for reducing college student anxiety symptoms.

The study focused on the following research questions:

1. What complementary and alternative medicine modalities are utilized by college students?
2. Is there a statistically significant change in state anxiety symptoms of college students after the utilization of complementary and alternative medicine?
3. Is there a statistically significant change in trait anxiety symptoms of college students after the utilization of complementary and alternative medicine?

The researcher hypothesized that participants would not only utilize a variety of CAM modalities, but would experience a reduction in both state and trait anxiety symptoms.

Research Design

This study examined if the use of CAM modalities results in a change in self-reported college student state and trait anxiety symptoms by using a quantitative, quasi-experimental one-group pretest-posttest design. This research design was chosen because participants were not selected through random assignment (Creswell, 2014). The one-group pretest-posttest design consisted of a single group of participants receiving a pretest measure and posttest measure (Creswell, 2014).

A pretest-posttest design was selected for this study because quasi-experimental designs are used to measure the effectiveness of an intervention (Sousa, Driessnack, &

Mendes, 2007), and pretest-posttest designs are designed to measure a change resulting from experimental treatments (Dimitrov & Rumrill, 2003). Vogt (2005) reported that a quasi-experimental research design is beneficial in real life situations when a researcher may be able to manipulate an independent variable but not randomly assign participants to experimental or control groups, meaning, when using a quasi-experimental design, assignment to conditions is completed through self-selection (White & Sabarwal, 2014). Sometimes determinations about causality are less definitive with quasi-experimental designs in comparison to a randomized control trial (White & Sabarwal, 2014).

Research Context

This study was conducted at a predominantly four-year public institution of higher education referred to as the University. The University is a college in the northeast region of the United States and has approximately 3,500 undergraduate students, with 92% full-time students. An estimated 51% of the students have a family income of less than \$40,000, and the student population is 79% White, 10% Black, 6% Hispanic, 2% biracial, 1% Asian, 1% American Indian, Alaska Native, 1% Native Hawaiian/Pacific Islander, and 1% unknown.

The University has three relaxation rooms that include CAM modalities such as aromatherapy, biofeedback training, guided meditation, and massage chairs. The room used in the study is located in the wellness center on campus and was referred to as the “Renew” room. The Renew room includes the following CAM practices/treatments:

1. Two Osaki OS-4000 Massages Chairs, full body massage chairs, have four different massage modes (tapping, kneading, Shiatsu, and a tap-kneading combination). The chairs have 16 airbags that inflate to create compression

and have a built-in MP3 player.

2. One Wild Divine Iom training hardware technology system (The IomPE, 2016), which is compatible with both Microsoft Windows and Mac systems. Wild Divine technology (The IomPE, 2016) allows individuals to monitor physiological functions that may be indicative of high levels of stress, such as rapid breath or increased heart rate. Wild Divine is a form of biofeedback, which can assist students to exercise control over their emotions by using interactive software and relaxation videos. The Iom finger sensors monitor signs of relaxation, which guides students attempting to learn calming techniques to reduce state anxiety symptoms.
3. One multi-spectrum lamp, used as light therapy, which may assist students with increased energy and improved mood, and is often used in conjunction with other CAM modalities in the room.
4. An audio library that is continually updated and downloaded on MP3 players with headphones; it contains meditative guides such as *Guided Meditation for Difficult Times: A Lamp in the Darkness* by Jack Kornfield; *Works of Deepak Chopra* by Deepak Chopra; *Breathing: The Master Key to Self-Healing* by Andrew Weil, M.D.; *Music for Healing Mind, Body, and Spirit* by Steven Halpern; *Ahanu Tibetan Singing Bowls for Relaxation and Meditation, Guided Meditations for Stress Reduction* by Bodhipaksa; *Your Breathing Easy: Meditation and Breathing Techniques to Help You Relax, Refresh, and Revitalize* by Michael F. Roizen, M.D. and Mehmet C. Oz M.D.; *Your Present: A Half Hour of Peace* by Susie Mantell; and *Songbird Sunrise and*

Thunderstorm with Alpha Brainwave Pulses by Dr. Jeffrey Thompson.

5. Aromatherapy, which uses organic plant materials known as essential oils and other aromatic compounds to improve mood, cognitive function, and overall health. Experimenting in Renew is encouraged in order to aid students in learning which essential oils assist them with relaxation and rejuvenation.

Research Participants

To be eligible to participate in this study, participants needed to be traditional age college students (between 18 and 24 years old), enrolled in at least one class at the University, and self-selecting to attend the wellness center on campus. According to reports generated from the wellness center's electronic medical record system, the average number of students that visit the wellness center each semester is 1,980. Of the 1,980 students, approximately 240 traditional age students use the Renew room each semester. Eligible students became participants in the study when they self-selected to participate in this study as advertised in the wellness center. All participants ($N = 43$) met the eligibility requirements for the study and mirrored the demographic characteristics of the University (see Table 3.1). Data provided from the demographic survey indicated the sample was mainly female, primarily residential, with 65% of the participants having a GPA less than the University's average GPA of 2.72. Students from all academic years (freshman, sophomore, junior, and senior) were represented in the study. Data from the Demographic Survey indicates that 21% of the sample reported it was their first time using the Renew Room.

Table 3.1

Demographic Characteristics of Participants Compared to the University Demographic Population

Variable	Sample		University	
	<i>n</i>	%	<i>n</i>	%
Gender				
Male	17	39.5	2,363	63
Female	26	60.5	1,372	37
Academic Year				
Freshman	13	30.2	1,394	37
Sophomore	5	11.6	399	11
Junior	14	32.6	444	12
Senior	11	25.6	1,498	40
Transfer Student	8	18.6	1,345	36
Race/Ethnicity				
Non-white	14	32.5	1,003	27
White	29	67.5	2,732	73
Residence				
Commuter	8	18.6	1,303	35
Residential	35	81.4	2,432	65
GPA				
1.5 to 1.9	3	7.0	270	8
2.0 to 2.49	11	25.6	713	21
2.5 to 2.99	14	32.6	919	27
3.0 to 3.49	10	23.3	819	24
3.5 to 3.99	5	11.6	689	20

Note. Data obtained from the University website and the University's Institutional Research Analyst.

Procedures for Data Collection

The procedures for data collection began as soon as the IRB proposal was approved by the collaborating institutions. Data were collected for this study over a five-week period in spring 2017 through the use of convenience sampling. Participants were invited to participate through flyers (see Appendix A) posted in the wellness center, and

all eligible students (i.e., students 18-24, enrolled in at least one course during the semester) received a research packet when they checked in at the front window of wellness services. The packet included a Student Letter (Appendix B), an informed consent form (Appendix C), and an envelope addressed to the wellness center. The Student Letter included a description of the study and a phone number for potential participants to call with questions about the study. The informed consent form had a Participant Number located in the top right corner with information stating that the number would be how the student would identify themselves during the study. If students agreed to participate, they signed the informed consent form, put it in the envelope provided, and returned it to the drop box at the wellness center.

When the researcher received the informed consent, she contacted the prospective participant by phone. During the call, she ensured that the participant understood the consent form, purpose of the study, answered any questions, and then scheduled a 90-minute session at a mutually convenient time in Renew using the participant's participant number. Students that agreed to participate in the study were entered into a drawing with 15 chances to win a \$25 VISA gift card. Participants were informed of their entry in the drawing during the phone call.

Instruments Used in Data Collection

The instruments used in the data collection procedures for the current study were the Demographic Survey (Appendix D), the College Student Feelings pretest-posttest surveys, and the CAM Usage Survey (Appendix E). The Demographic Survey is an author-created survey designed to gather basic participant information. The survey consisted of 10 questions about academic year, transfer student status, age, gender,

race/ethnicity, residential or commuter, and current GPA. The second instrument, referred to as the College Student Feelings, is the State-Trait Anxiety Inventory for Adults (STAI-AD), Form Y, and was developed by Charles Spielberger (1983) with the purpose of measuring the self-reported presence and severity of temporary and long-term anxiety symptoms. The STAI-AD was easy to select for this study due to its ease of administering as well as its high internal consistency with college student populations, with scores exceeding a Cronbach's alpha of .90 (Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983). The third instrument was the CAM Usage Survey, which was developed for the purpose of this study, and consisted of six questions, which varied in format. The questions on the survey were designed to gather data from participants about what CAM modalities they used and which modalities were most helpful in treating the participants' anxiety symptoms.

CAM treatment procedures. When participants arrived at the wellness center for their appointment, they checked in with the front desk, and then were brought to Renew by the researcher. Once in the room the participants completed the demographic information survey and the College Student Feelings pretest survey using a paper-and-pencil design. The researcher reminded the participant what his or her participant number was, and the participant wrote the number on the space provided on all forms.

Following the completion of the surveys, participants completed a twenty-minute tutorial session by the researcher in order to learn how to use the CAM modalities in Renew. The researcher followed a tutorial session script during the training session to ensure all participants received the same information about the CAM modalities in Renew. The researcher provided the training session for every participant.

Immediately following the tutorial session, participants were encouraged to complete a one-hour session in Renew. During the session, participants stayed in Renew alone and used the hour session to self-select what CAM modalities they preferred to use. Following the session, the researcher returned to the room and gave the participant the CAM Usage Survey and the College Student Feelings posttest survey using a paper-and-pencil design. The researcher reminded the participant of his or her participant number and the participant wrote the number in the space provided on all forms. The researcher stood outside the Renew room while the participant stayed to complete the surveys and then left the completed surveys on a clipboard inside the room. After the participant left the room, the researcher pointed them in the direction of the exit door and then collected the completed surveys from the Renew room.

Data analysis. A database was set up and data were manually entered from paper-and-pencil surveys into the Statistical Package for the Social Sciences (SPSS). The researcher did all data entry and conducted all data analysis. Demographic data were analyzed using descriptive statistics of frequencies and percentages in order to describe and compare the sample to the demographics of the college. For the purposes of this study, the dependent variable was the self-reported levels of state and trait anxiety symptoms, and the independent variables were the CAM modalities in the Renew room.

Research Question 1 asked what CAM modalities are utilized by undergraduate college students, and was answered by analyzing the frequencies and percentages of the self-selected CAM modalities. Enjoyment of those modalities was analyzed by calculating the minimum and maximum scores, means, and standard deviations. Further analysis was done to analyze potential differences in usage and enjoyment of CAM

modalities by gender, academic year, transfer status, racial/ethnic identity, residential status, and GPA. Chi-squared analyses were run to test for demographic differences in the usage of each modality. A chi-squared test is a non-parametric analysis that tests the relationship between two nominal variables. It compares the observed frequencies in each cell of a cross tab table with the frequencies that would be expected if the null hypothesis is true (Urduan, 2010). A series of one-way ANOVAs were run to test for demographic differences in the enjoyment of each modality.

Prior to testing whether there was a statistically significant change in self-reported state and trait anxiety symptoms, the pre and posttest state and trait anxiety scores were tested for any differences between groups based on gender, academic year, transfer status, racial/ethnic identity, residential status, and GPA. The question of whether there were changes in self-reported state and trait anxiety symptoms was first answered by a preliminary examination of the means and standard deviations of the pre and posttest state and trait anxiety scores. Seeing descriptive differences in those scores, a test of statistically significant change was conducted using a repeated measures ANOVA for state anxiety and a repeated measures ANCOVA with gender as the covariate for trait anxiety. A repeated measures ANOVA is an appropriate test when looking for a within-group difference with a scaled dependent variable (Huck, 2012; Urduan, 2010). The test can be used to determine whether the scores on a scaled dependent variable change over time (Urduan, 2010). The inclusion of a covariate is appropriate when the covariate may be related to the change in the dependent variable (Urduan, 2010).

Since a repeated measures ANOVA assumes the absence of outliers and a normal distribution of the dependent variable, data from participants' STAI-ADs were screened

for outliers and for a normal distribution in the dependent variables. Finding no violations of the assumptions, the analysis proceeded with the pre and posttest state anxiety scores in the first repeated measures ANOVA and the pre and posttest trait anxiety scores in the second repeated measures ANOVA. The significant differences that were detected were then interpreted by comparing the group means and examining the effect sizes.

Chapter Summary

The purpose of the study was to discover what CAM modalities college students prefer to use and if using CAM modalities can reduce college student state and trait anxiety symptoms. The methodology for this study was a quantitative, one-group pretest-posttest design to determine possible relationships between CAM modalities used and self-reported state and trait anxiety symptoms of college students (Creswell, 2014; Dimitrov & Rumrill, 2003). The instruments used to collect data consisted of a demographic survey, pretest-posttest STAI-AD (Spielberger et al., 1983), and the CAM Usage Survey. Descriptive statistics and analysis of variance were conducted on the data from the surveys to answer the research questions. The following chapter presents the findings from this study.

Chapter 4: Results

Anxiety continues to be one of the most prevalent issues negatively affecting the college student population (Bamber & Schneider, 2016; Barrera & Norton, 2009; Beiter et al., 2015; Oman et al., 2008; Ratansiripong et al., 2012). Therefore, the purpose of the current study was to examine what CAM modalities college students prefer to use and if using CAM modalities reduced college student state and trait anxiety symptoms. Chapter 4 presents the findings of the study based on statistical analysis of the data from a demographic survey, CAM Usage Survey, and pretest/posttest State-Trait Anxiety Inventory for Adults (STAI-AD). After preliminary descriptive analyses were conducted, the data were analyzed using two repeated measures ANOVAs and a series of one-way ANOVAs to determine if there was a statistically significant change in reported state or trait anxiety symptoms of college students.

This study includes a cross-sectional convenience sample using quantitative surveys to answer the following research questions:

1. What complementary and alternative medicine modalities are utilized by undergraduate college students?
2. Is there a statistically significant change in reported state anxiety symptoms of undergraduate college students after the utilization of complementary and alternative medicine?
3. Is there a statistically significant change in reported trait anxiety symptoms of

undergraduate college students after the utilization of complementary and alternative medicine?

Based on a review of the literature, it was hypothesized that participants will not only utilize a variety of CAM modalities, but will experience a reduction in both state and trait anxiety symptoms, when provided a conducive environment, such as the Renew room, to use CAM modalities

Descriptive Results

CAM modalities. The first research question asked what CAM modalities are utilized by undergraduate college students. To answer this question data from the CAM Usage Survey was analyzed using descriptive analysis. This six-item survey addressed which CAM modalities were used, participant enjoyment of CAM modalities, as well as problems with or feedback about the CAM modalities in the Renew room.

Question 1 on the CAM Usage survey asked participants which CAM modalities they used during their hour in Renew. A frequency analysis was conducted based on the results of this question and the results indicated the massage chair CAM modality was used by 100% of the participants during the 60-minute session. The second most used CAM modality reported by participants was aromatherapy (90.7%), followed by the multi-spectrum lamp (74.4%) and face massager (74.4%). A complete list of CAM modality usage is reported in Table 4.1.

The second question on the CAM Usage Survey asked participants to rate enjoyment of the CAM modalities they used on a scale of 1 to 10. On this scale, 1 indicates participants did not enjoy the CAM modality at all, and 10 indicates high enjoyment of the CAM modality. The enjoyment of the CAM modalities followed a

similar rank order as the usage of CAM modalities. The massage chair was the most enjoyed modality ($M = 9.2, SD = 1.5$) and aromatherapy was the second most enjoyed modality 8.2 ($M = 8.2, SD = 1.7$). The multi-spectrum lamp and the face massage were rated lower ($M = 5.9, SD = 2.6$ and $M = 5.2, SD = 2.6$, respectively), indicating that these CAM modalities were only somewhat enjoyed by participants. The enjoyment means and standard deviations for all CAM modalities are reported in Table 4.1.

Table 4.1

CAM Modality Use and Average Levels of Enjoyment from 1 to 10

Modality	Used		Enjoyment	
	N	%	M	SD
Massage Chair	43	100	9.1	1.5
Aromatherapy	39	90.7	8.2	1.7
Multi-Spectrum Lamp	32	74.4	5.9	2.6
Face Massage	32	74.4	5.2	2.6
Wild Divine	26	60.5	4.6	2.4
Audio Library	25	58.1	6.1	2.6

Note. A score of 1 indicates “did not enjoy” and a score of 10 indicates “enjoyed very much.”

Questions 3 and 4 on the CAM Usage Survey asked participants what CAM modalities they would have used if given more time in the Renew room and if they encountered any problems. When asked about CAM modalities they would return to if given more time, the three modalities most frequently cited were the massage chair (16.3%), audio library (14%), and Wild Divine biofeedback system (11.6%). Very few

users reported any problems with using the modalities. The only problems reported were with the Wild Divine biofeedback system ($n = 3$) and audio library ($n = 1$).

Question 5 and 6 on the CAM Usage Survey asked how satisfied participants were with their experience in the Renew room and how likely participants were to return at a future date. Participants indicated their experience in the Renew room was very satisfactory. On a scale of 1 (“Not at all satisfied”) to 4 (“Very satisfied”), the mean was 3.7 ($SD = .05$), indicating high satisfaction. Rating their likelihood of returning on a scale that ranged from 1 (“Definitely will not”) to 5 (“Definitely will”), participants indicated a high likelihood of using the Renew room again, with a mean of 4.5 ($SD = 0.7$).

To determine if there were any potential differences in usage and enjoyment of CAM modalities by gender, academic year, transfer status, race/ethnicity, residential status, and GPA, chi-squared analyses were used. The only significant difference was that more women (73%) chose to use Wild Divine than did men (41%) (Chi-squared = 4.38, $p = .04$). All other analyses were not significant. Also, a series of one-way ANOVAs were run to test for differences in enjoyment and use of each modality based on demographic variables. For the enjoyment variables, ANOVAs were used because the independent variable is categorical (i.e., demographics) and the dependent variable was scaled (i.e., 1–5 rating of enjoyment). The only significant difference was for GPA and enjoyment of the face massager, wherein students with a GPA between 2.0 and 2.99 reported the highest levels of enjoyment as compared to all other groups. All other enjoyment tests were not significant. The results from the CAM Usage Survey response analysis identified the massage chair and aromatherapy as the most liked and used CAM modalities in this study. Student enjoyment of these two modalities proved true

regardless of several demographic differences, including gender, GPA, race, and academic year.

State anxiety. The second research question examined the effect of CAM modalities on student users' state anxiety. State anxiety is defined as how individuals feel presently; considered a temporary condition (Spielberger, 1977). Scores for state anxiety were compiled according to the STAI-AD manual (Spielberger et al., 1983). There are 20 items on the state anxiety scale that asked students to rank how they feel about certain events or situations on a scale of 1 to 4, wherein 1 is low anxiety and 4 is high anxiety. A total score was computed according to manual instructions, yielding potential values of 20 to 80, wherein 20 is lower anxiety and 80 is higher anxiety.

Preliminary analyses to evaluate potential influences of demographic characteristics on the pretest and posttest state anxiety scores were run using a series of one-way ANOVAs. There were no significant differences in the pretest and posttest state anxiety scores for any of the demographic variables. Therefore, the analyses proceeded with the repeated measures ANOVA with no covariates included. With a repeated measures ANOVA analysis, statistical significance, determined by a p -value less than .05, indicates that the difference between the means is unlikely to occur if the null hypothesis is true (Gamst, Meyers, & Guarino, 2008; Urdan, 2010). However, the p -value was not able to indicate how strong of an effect the Renew room had on state anxiety scores. To interpret strength of a significant effect, it is necessary to use a measure of effect size (Gamst et al., 2008; Urdan, 2010).

In the repeated measures ANOVA analyses, eta-squared was used as the measure of effect size. Eta-squared indicates how strongly the anxiety levels are related to the

effects of the Renew room. Also known as R-squared, eta-squared describes the data in the sample and ranges from 0 to 1. Eta-squared is interpreted as the percentage of variance in the dependent variable (e.g., state anxiety score) that is explained by the independent variable (e.g., use of CAM modalities within the Renew room). Interpreting eta-squared depends on the context of the research (Gamst et al., 2008). Although what a researcher interprets to be a weak, moderate, or strong effect can vary, common cut-offs are eta-squared values of .09 or less are considered weak, .10 to .21 are considered moderate, and .22 or higher are considered strong (Gamst et al., 2008).

As shown in Table 4.2, the repeated measures ANOVA found that participants experienced a decrease in state anxiety after one hour utilizing CAM modalities in the Renew room ($F(1, 41) = 9.70, p = .003, \eta^2 = .19$). The scores for pretest state anxiety had a mean of 48.5 ($SD = 11.9$), and the posttest state anxiety scores had a mean of 29.9 ($SD = 7.3$), indicating a decrease in state anxiety. It should be noted that the effect size ($\eta^2 = .19$) indicates a moderate effect. This finding indicates that students' state anxiety decreased after one hour in the Renew room. Therefore, the hypothesis of the second research question was supported; that is, there is a statistically significant change in reported state anxiety symptoms of undergraduate college students after the utilization of CAM.

Trait anxiety. The third research question examined the effect of CAM modalities on student users' trait anxiety. Trait anxiety is defined as individual's vulnerability to respond to a stressor or fear, which in turn elicits anxiety symptoms (Basak & Hansda, 2016; Garcia et al., 2013; Lau et al., 2006; Spielberger, 1975). Scores for trait anxiety were computed according to the manual (Spielberger et al., 1983). There

are 20 items on the trait anxiety scale, each item ranging from 1 to 4 wherein 1 is low anxiety and 4 is high anxiety. For current analyses, a total score was computed according to manual instructions, yielding potential values of 20 to 80, wherein 20 is lower anxiety and 80 is higher anxiety.

Preliminary analyses to evaluate potential influences of demographic characteristics on the pretest and posttest trait anxiety scores were run using a series of one-way ANOVAs. One way ANOVAs are used to separate the total variance in the dependent variable in order to determine between group differences as well as determine individual differences within the same group (Urdu, 2010). The only significant difference in post trait anxiety was based on gender ($F(1, 41) = 5.38, p = .03, \eta^2 = .12$). The difference was such that females reported significantly higher trait anxiety ($M = 41.2, SD = 11.2$) at the posttest than did males ($M = 33.7, SD = 9.0$). Therefore, for the repeated measure ANOVA for trait anxiety, gender was included as a covariate.

As shown in Table 4.2, the repeated measures ANCOVA revealed a significant difference between the pretest and posttest means for trait anxiety ($F(1,41) = 8.82, p = .005, \eta^2 = .18$). The difference was such that the pretest mean (51.7) was higher than the posttest mean (38.3). For trait anxiety, the eta-squared was .18, indicating a moderate effect. This finding indicates that students' trait anxiety decreased. Therefore, the hypothesis for the third research question was supported; that is, there is a statistically significant decrease in reported trait anxiety symptoms of undergraduate college students after the utilization of CAM.

Table 4.2

Description of Anxiety State and Trait Scores, Pre and Post

Measure	Mean	SD	<i>F</i>	<i>P</i>	η^2
Model			8.82	.005	.18
TRAIT pretest	51.7	11.6			
TRAIT posttest	38.3	10.9			
Model			9.70	.003	.19
STATE pretest	48.5	11.9			
STATE posttest	29.9	7.3			

Summary of Results

The study examined the CAM usage of 43 traditional age college students enrolled at the university to discover the impact of CAM usage on trait and state anxiety symptoms. The data collected from the demographic survey, pretest-posttest surveys, and the CAM Usage Survey, were entered into SPSS. Descriptive statistics, two repeated measures ANOVAs, and a series of one-way ANOVAs were conducted to gather all the data reported in this chapter. Repeated measures ANOVAs were computed to determine if there were statistically significant differences in the mean total pretest state and trait anxiety score and posttest state and trait anxiety score of college students that participated in this study. Statistically significant differences were found for both state and trait anxiety score means. The change was positive, indicating a decrease in anxiety symptoms after the one-hour visit in the Renew room, even after controlling for gender. These findings support the hypothesis that participants would use a variety of CAM modalities

and that participants would experience a reduction in both state and trait anxiety. The implications of the results will be discussed in Chapter 5.

Chapter 5: Discussion

Introduction

Many college students in the United States are struggling to be successful due to debilitating anxiety symptoms (Ratanasiripong et al., 2012). In 2015, 21.9% of college students reported that anxiety negatively affected academic performance, which reflects a 100% increase over the past 15 years (Bamber & Schneider, 2016). If left untreated, anxiety symptoms can manifest into anxiety disorders (APA, 2013; Bamber & Schneider, 2016). College students who have been diagnosed with anxiety disorders report having a worse quality of life than individuals who do not struggle with anxiety (Barrera & Norton, 2009; Beiter et al., 2015). College student suicide attempts have also been linked to the decomposition of mental health from battling anxiety symptoms (Weisberg et al., 2014; Westfield et al., 2005). Ratanasiripong et al. (2012) suggests access to CAM modalities on college campuses could provide students the opportunity to treat anxiety symptoms holistically or in combination with other treatment strategies, such as medicine and/or cognitive-behavioral therapy. This study examined the utilization of CAM modalities by college students and if CAM modalities were effective in reducing self-reported state and trait anxiety symptoms in college students. A quantitative, quasi-experimental, pretest-posttest design was used to answer the following research questions:

1. What complementary and alternative medicine modalities are utilized by college students?

2. Is there a statistically significant change in state anxiety symptoms of college students after the utilization of complementary and alternative medicine?
3. Is there a statistically significant change in trait anxiety symptoms of college students after the utilization of complementary and alternative medicine?

Three major findings emerged from this research study, corresponding with the three research questions. The first finding is that college students in this study used and enjoyed the massage chair and aromatherapy more than the other CAM modalities. Second and third, there was a statistically significant change in both state and trait anxiety symptoms of college students after the utilization of CAM modalities for one hour. These results have obvious implications related to CAM as a treatment strategy for college student state and trait anxiety symptoms, but are also relevant to research, professional practice, and leadership.

Chapter 5 is divided into four sections. The first section examines the implications of the findings from the CAM Usage Survey and the pretest/posttest State-Trait Anxiety Inventory for Adults (STAI-AD). The second section explores the limitations of the study. The third section includes recommendations for future research, wellness center services on college campuses, and which CAM modalities to provide for college students suffering from anxiety symptoms. The last section provides an overview of the study.

Implications of Findings

The findings from this study provide several implications related to CAM as a treatment strategy for college student anxiety. The implications for research of CAM usage as a treatment strategy to reduce college student anxiety symptoms is discussed in this section. Implications for professional practice for wellness centers to offer CAM

modalities in higher education institutions are also discussed in this section. This section also discusses the findings of the study in context of college students and senior leadership at universities.

Research. From the current study, the results that CAM modalities are an effective treatment strategy for reducing college student anxiety symptoms is consistent with the findings from several other studies (Caldwell et al., 2011; Henriques et al., 2011; LaCaille & Kuvaas, 2011; Mhatre et al., 2011; Nowak et al., 2015; Oman et al., 2011; Ratansiripong et al., 2012; Synovitz et al., 2006). This study's findings were also consistent with several other studies (Johnson & Blanchard, 2006; LaCaille & Kuvaas, 2011; Synovitz et al., 2006) in that massage and aromatherapy are used by college students at a higher rate than other CAM modalities in order to reduce anxiety symptoms. Additionally, Ratansiripong et al. (2012) and Henriques et al. (2011) found biofeedback effective at reducing anxiety symptoms in college students, which supports the findings of this study that biofeedback is effective at reducing anxiety symptoms in college students.

The findings of this study suggest various CAM modalities, not only biofeedback, can be used to treat college student anxiety symptoms, independent from other forms of treatment. These results support Henriques et al. (2011) findings that CAM modalities can be an effective strategy for treating anxiety symptoms in college students as a standalone treatment strategy. The current study and Henriques et al. (2011) both applied a pretest posttest design using the STAI (Spielberger et al., 1983) to examine if CAM modalities could be effective at reducing anxiety symptoms in college students. However, this study expanded on the results of Henriques et al. (2011) by allowing participants to

self-select from a host of CAM modalities including a massage chair, aromatherapy, biofeedback, audio library, face massager, and the multi-spectrum lamp. While Henriques et al. (2011) only examined biofeedback as a CAM treatment strategy for anxiety symptoms, the results from this study suggest a variety of CAM modalities can be significantly effective at reducing anxiety symptoms in some college students. Henriques et al. (2011) found a significant reduction in self-reported anxiety symptoms of college students that used biofeedback over a 4-week period, while the current study found a reduction in anxiety symptoms after only one hour of using various CAM modalities, including biofeedback. Therefore, the results from this study supports and expands on the results of previous studies by suggesting that college students with the option to self-select from a variety of CAM modalities in a private relaxation room for at least 1 hour can experience a reduction in anxiety symptoms.

The current study expanded on Ratansiripong et al. (2012) research, which examined the effectiveness of biofeedback in tandem with traditional counseling over a 4-week period. The findings of this study indicate that CAM modalities, such as massage and aromatherapy, are effective at reducing anxiety symptoms in a one-hour session in the Renew room. The current study added to the body of research by finding that several CAM modalities, self-selected by college students in a private relaxation room, is effective at reducing self-reported state and trait anxiety symptoms. Therefore, using several CAM modalities can be an effective short-term treatment strategy for reducing anxiety symptoms in college students.

Consistent with mindfulness theory, the findings of this study suggest that when participants took notice of their surroundings and became active participants in their

treatment, their well-being improved. The current study described mindfulness as a CAM practice. Mindfulness is an attempt to describe how one is aware of his or her present without judgment (Haigh et al., 2011). Langer's definition of mindfulness, which she developed utilizing the framework of cognitive information processing, is this:

[A]s a general style or mode of functioning through which the individual actively engages in reconstructing the environment through creating new categories or distinctions, thus directing attention to new contextual cues that may be consciously controlled or manipulated as appropriate. (Langer, 1989, p. 4)

The findings of this study expand on Langer's theory of mindfulness by allowing participants to self-select which CAM modalities to use in the space. Self-selecting the CAM modalities allowed participants to take notice of what was available in the Renew room and then become responsible for their own treatment. Langer employed her theory mostly with the elderly population in a nursing home setting, where the current study employed the theory with college students in a university setting.

Langer's theory was based on studies involving elderly residents in a nursing home, the findings from this study suggest that the proponents of mindfulness as a means for improving the health and well-being of individuals may also be applicable to college students at institutions of higher education. Langer's (2014) research supported findings that behaviors indicative of mindfulness—choosing daily activities and caring for a plant—have a positive effect the quality of life in the aging population. The current study's findings that anxiety symptoms were reduced in college students after one hour of using self-selected CAM modalities could mean that college students experienced a reduction in both state and trait anxiety symptoms when they were provided an

opportunity to play an active role in their treatment. Therefore, an implication of this study is that Langer's mindfulness theory can be applicable to college students as well as any individual who is willing to be an active participant in their treatment. College students' quality of life could improve when they actively engage in treatment and have some control over their own treatment decisions.

Professional practice. Some colleges and universities have attempted to address anxiety and its consequences through wellness center services on campus. College wellness centers are using conventional medicine such as cognitive behavioral therapy and medication, which are provided by trained medical and mental health professionals (Ratansiripong et al., 2012). Conventional/traditional medicine can be described as treatment that is widely accepted in healthcare (unlike alternative medicine, which is not widely used in the United States) and requires a trained professional to work with the patient (Bystritsky et al. 2012; Liu et al., 2014). Conventional forms of treatment for anxiety, such as CBT and psychotropic medication, require several appointments and a longer period before experiencing a reduction in anxiety symptoms (Kaufman & Baucom, 2014; Stone & Merlo, 2011). Conventional treatment could also be a financial burden for some students (Henriques et al., 2011). Conventional treatment can be ineffective if wellness centers limit the number of sessions a student can attend or do not offer hours conducive to student schedules (Grasgreen, 2011; Ratansiripong et al., 2012). However, conventional medical methods are not the only treatment that is effective at reducing anxiety symptoms in college students (Bishop et al., 2007; Caldwell et al., 2011; Henriques et al., 2011; LaCaille & Kuvaas, 2011; Mhatre et al., 2011; Nowak et al., 2015; Oman et al., 2011; Ratansiripong et al., 2012; Synovitz et al., 2006). This study's

findings that CAM modalities reduce anxiety symptoms in college students after a one-hour session in the Renew room implies that CAM modalities can be effective treatment strategies in reducing anxiety symptoms of college students. College and university wellness centers that choose to offer CAM modalities as an anxiety treatment on campus may find a decrease in college student anxiety and counseling appointments.

In addition, the finding that CAM modalities are effective at reducing anxiety symptoms as a standalone treatment strategy suggests college students could experience fewer and reduced anxiety symptoms over a short period of time, at a lower cost than conventional treatment, and without the need for assistance from a trained professional (Ratansiripong et al., 2012). Therefore, an implication for professional practice is that CAM is effective at reducing anxiety symptoms as a standalone treatment strategy for both short-term and long-term anxiety symptoms, which could assist wellness centers with treating more students in a shorter period. The addition of CAM modalities to the services that wellness centers offer could reduce the workload of counselors, as well as provide another treatment option for students who do not want to engage in traditional counseling. Reduced demand for trained mental health professionals is an important implication of this study. College wellness centers do not have enough trained professionals to meet the mental health needs of all students (Ratansiripong et al., 2012). Grasgreen (2011) reported that in 2010, at over 400 colleges in the United States, anxiety was the number one reason college students sought out counseling centers. While not a substitute for one-on-one support from a trained provider, CAM has the potential to augment treatment in an already taxed area. Offering CAM modalities in a designated relaxation room could assist wellness centers and staff to manage high caseloads.

While this study did not focus on which CAM modalities were most effective in reducing anxiety symptoms, it did measure which CAM modalities were most frequently used by college students. The results indicated that the massage chair was the most used modality, followed by aromatherapy. These findings are consistent with the findings from Johnson and Blanchard (2006) and Synovitz et al. (2006). Johnson and Blanchard (2006) found the most popular CAM modality used by college students was massage, followed by yoga, relaxation, aromatherapy, megavitamins, and chiropractic care. Synovitz et al. (2006) found the most popular CAM modality used by college students was massage, followed by herbal supplements, yoga, aromatherapy, meditation, and chiropractic care. Massage and aromatherapy were the only two modalities available in the current study that were the same as in the Johnson and Blanchard (2006) and Synovitz et al. (2006) studies. These corresponding results suggest that for over a decade, some college students have used massage and aromatherapy at a higher rate than other CAM practices to reduce anxiety symptoms. Therefore, college and university health professionals seeking effective, low-cost ways may see a reduction in student anxiety symptoms by offering students opportunities to use aromatherapy and massage chairs.

A final implication for professional practice relates to increasing student retention rates. An estimated 62% of college students list anxiety to be one of the most common reasons they did not continue to stay enrolled in college (Basak & Hansda, 2016). Results from this study showed that college students who experienced an hour of CAM modalities in a designated relaxation room reported a significant reduction in anxiety symptoms. The reduction in anxiety symptoms for participants in this study occurred regardless of gender, academic year, transfer status, race/ethnicity, residential status, and

GPA. Retention rates could be improved by offering students opportunities to utilize CAM modalities in designated relaxation rooms.

College students. Previous research has determined many college students use CAM modalities to treat anxiety symptoms (Caldwell et al., 2011; Johnson & Blanchard, 2006; LaCaille & Kuvaas, 2011; Oman et al., 2008; Synovitz et al., 2006). Bishop et al. (2007) and Mhatre et al. (2011) found that the college student population might prefer CAM to other traditional treatment strategies because CAM may better align with their personal belief system and lifestyle, as well as allow students to play a more active role in their treatment. In the current study, college students experienced a reduction in anxiety symptoms after self-selecting what CAM modalities they wanted to use during a one-hour session in the Renew room. These findings imply that college students who self-select what CAM modalities to use are playing an active role in their treatment, which could be a factor in their experiencing a reduction in both state and trait anxiety symptoms after one hour in a relaxation room using CAM modalities.

The current study suggests that college students benefit from using CAM modalities due to their healing effects on reducing anxiety symptoms in just one hour. Several CAM modalities are affordable and easy to access. The results of this study that aromatherapy is used and enjoyed by college students at a higher rate than many other CAM modalities implies that college students who purchase diffusers and essential oils could have aromatherapy in their rooms on campus, and in one hour they could significantly reduce their anxiety symptoms.

Additionally, college wellness centers often have business hours that may not be conducive to the schedules of college students. If CAM modalities and relaxation rooms

were made accessible for college students, then such spaces could be used independently to reduce anxiety symptoms. A reduction in anxiety symptoms could then, in turn, improve an individual's ability to concentrate while studying, as well as improve quality of sleep.

Colleges and universities place priority on academics; however, there is a need to find effective treatment strategies to help students regulate emotions (Stoltzfus, 2015). Students who are not emotionally prepared to deal with the stressors of college struggle academically and are in need of access to resources to help them cope with their feelings (Stoltzfus, 2015). The results from this study indicate state and trait anxiety symptoms can be reduced after spending one hour in a relaxation room, which was easily accessible and provided a variety of CAM modality choices. Therefore, CAM can be an affordable and easily accessible treatment strategy for college student anxiety.

CAM modalities could be a solution for institutions of higher education because they can be used independently. A trained professional is not needed to administer the treatment. Accessibility to treatment could be improved if multiple relaxation rooms on campus with CAM modalities were provided. Therefore, an implication for college students is that they could reduce state and trait anxiety symptoms in just one hour if CAM modalities were easy to access on campus. Such a reduction in anxiety symptoms could have a positive effect on college students' academic performance as well as their social experience.

Leadership. Awards have been created and presented to student affairs departments that provide unique and innovative data-supported programs for college students. For example, the president of Student Affairs Administrators in Higher

Education (NASPA), stated that, “The NASPA Excellence Awards were created to recognize student affairs practitioners who develop transformative, innovative, and data-driven programs” (NASPA.org, 2017). The development of this award suggests that senior leaders in higher education are being encouraged to be open and receptive to new ideas on how to improve the mental health of their student body. Constructing designated relaxation rooms on college campuses, such as the Renew room, could be considered a type of transformative and unique program that focuses on improving the mental health of college students. In a thorough review of the literature there appears to be few colleges and universities in the United States that offer unique relaxation rooms on campus, and no empirical articles on the effectiveness of these spaces in treating college student anxiety.

Senior leaders have the potential to transform the culture of a college (Kouzes & Posner, 2012). A senior leader, who is transformational, understands the importance of experimenting with alternative approaches to benefit their group (Kouzes & Posner, 2012). This study’s use of CAM instead of conventional treatment to reduce student anxiety is an example of an alternative approach, which benefits the student population. Based on the findings in this study, students using CAM modalities in a relaxation room housed in a wellness center had statistically significant reductions in anxiety symptoms. The findings of this study should encourage academic leaders to prioritize building their own versions of the Renew room to support students. The success seen in this study of CAM modalities reducing college student anxiety symptoms implies that a senior leader seeking to be transformational would encourage shifting focus to the student as a whole, instead of aspects of the college experience such as academics and the social experience.

The development of designated relaxation rooms is one avenue to both provide college students with easier access to treatment and encourage college students to practice self-care.

Limitations

This section describes the limitations of this study that may influence the results and findings. First, the short time—one hour—between pre and posttest recording anxiety symptoms means the longer-term effects of CAM, are not addressed. Second, the self-reported nature of the anxiety symptoms of the participants means there was no standardized, diagnosed level of anxiety assigned to participants that would have allowed results to be more generalizable. For example, the current study did not collect information about the general clinical population, or specific groupings within the participants, such as which students had documented mental illnesses or disabilities. Third, the current study examined only a specific population—college students.

Recommendations

The findings from the current study along with the review of literature suggest several recommendations for future research, professional practice, and leaders in institutions of higher education. The hope is that future researchers will expand on the findings of this study to further validate that CAM modalities are effective at reducing anxiety symptoms in college students. Additionally, colleges and universities, as well as other organizations who are interested in helping staff and/or clientele reduce anxiety symptoms, will be encouraged to invest in constructing relaxation rooms with CAM modalities, such as massage chairs and aromatherapy.

Future research. Anxiety levels and the prevalence of anxiety diagnoses is on the rise, and college students are at great risk of suffering from anxiety symptoms (APA, 2013; Bamber & Schneider, 2016; Barrera & Norton, 2009; Beiter et al., 2015; Ratanasiripong et al., 2012). The current study's findings indicate that CAM modalities decrease both state and trait anxiety symptoms when examined after brief exposure. To examine the lasting impact of CAM as an anxiety treatment approach, a longitudinal study is needed. There is limited research on CAM as a treatment for college student anxiety, and at this time, there does not seem to be a precedent for lasting effects. The longest studies to date were performed by Ratansiripong et al. (2012) and Henriques et al. (2011), both of which used a data collection period of 4 weeks and a pretest-posttest survey that measured anxiety levels. In the Ratansiripong et al. (2012) study, participants completed a 30-minute-per-week biofeedback session over the 4-week data collection period. Each participant in the treatment group were also given a portable biofeedback device and were instructed to use it a few minutes per day, keeping a daily log of usage. Henriques et al. (2011) had participants in the treatment group use biofeedback five days a week for 20-minute sessions. On the posttest surveys for both studies, there was a reduction in anxiety symptoms compared to pretest levels. In order to better understand future studies should focus on better understanding if there are the long-term effects of other CAM modalities on anxiety symptoms.

Future research focusing on the long-term effects of using CAM modalities could employ the research design of Ratansiripong et al. (2012) and Henriques et al. (2011). Participants would visit a designated relaxation room—wherein either one or multiple CAM would be offered, depending on if the research wanted to determine general CAM

effects or the effects of a specific CAM—once a week during the 4 weeks between the pretest and posttest measure. Anxiety symptoms would be measured using the College Student Feelings Survey (STAI-AD), the same scale used by Henriques et al. (2011) and this study. The STAI-AD survey (Spielberger et al., 1983) has a high internal consistency with college populations, with scores exceeding a Cronbach's alpha of .90. Over a 2-month period, this survey has test-retest reliability coefficients of .65 to .75. Therefore, if extending the data collection period to the recommended 4-week period, the instrument used in the current study would still be a reliable instrument to use to collect data.

The current study adds to the body of literature on CAM modalities as an effective treatment strategy for student anxiety; however, future research could delve into the effects CAM usage on both a more general clinical population, as well as more specific groupings of students. The data collected for this study does not indicate statistically significant findings for the populations studied within the areas of documented disability, academic major, or mental health diagnosis and treatment history. Future research should explore the impact of CAM modalities on individuals within various segments of disabilities, majors, or diagnoses to determine if all students with anxiety symptoms are receiving the most effective treatment. This population-specific research could be performed by adding more detail to a demographic survey that would require participants to include detail relevant to whatever details the researcher wished to study. The results of such a population-specific study would introduce better understanding of how to treat anxiety symptoms in different student populations. For example, if a researcher were interested in which CAM modalities were most popular for

people within a certain major, such as nursing, he or she would include additional questions asking for details of participants' major on the Demographic survey.

Senior leaders. The current study is an examination of the usage of CAM modalities as a treatment strategy for college student anxiety. However, previous research indicates that anxiety is affecting college retention and persistence to graduation rates (ACHA, 2016; Ratanasiripong et al., 2012). College student anxiety has been linked to a decline in overall mental health and, in turn, can have negative implications throughout the course of young people's lives (Oman et al., 2008; Ratanasiripong et al., 2012). The results of this study found that anxiety symptoms decrease after a 60-minute session in the Renew room. Senior leaders at educational institutions interested in higher student retention and lower student anxiety should invest in building or repurposing areas as designated student relaxation rooms that provide CAM modalities. Such an investment in relaxation rooms may increase retention for higher education institutions. Students could access CAM modalities as a healthy alternative to manage their anxiety symptoms in a way that fits with their schedule (e.g., the need to seek anxiety help outside of normal business hours when a counselor might not be available), and avoids the stigma associated with traditional counseling, or the need to take psychotropic medication to deal with their anxiety (Hooley et al., 2017; Ratanasiripong et al., 2012). These multiple benefits provide strong encouragement for senior leaders at universities and colleges to invest in relaxation rooms for students.

Relaxation room construction. Relaxation rooms are designated spaces that include CAM modalities such as aromatherapy, biofeedback, guided meditation, and aromatherapy. These designated rooms may benefit higher education institutions as well

as students. Colleges and universities can construct a relaxation room for a relatively inexpensive price when compared with the cost of paying a trained counselor. There are two important aspects to consider when building a relaxation room. First, identify accessible, relatively quiet spaces throughout campus. Second, select the CAM modalities for the relaxation room based on evidence-based practices, such as the current study. This study found college students enjoyed and used the massage chair and aromatherapy the most of the offered modalities. Thus, it is recommended that future relaxation spaces on college campuses include these modalities.

A relaxation room can be tailored to fit any organization that is interested in investing in the health and well-being of its employees and clientele. Some examples of high stress environments that could benefit from designated relaxation rooms infused with CAM modalities are corporate offices, airports, doctor offices, and other office settings (Odedra, Friedland, Smith, & Weinkle, 2012). Identifying accessible, relatively quiet spaces is the first step in creating a relaxation room, regardless of the type of organization. The current study's findings that the massage chair and aromatherapy were the most used and enjoyed CAM modalities, is consistent with several other studies (Johnson & Blanchard, 2006; LaCaille & Kuvaas, 2011; Synovitz et al., 2006). Therefore, a recommendation for any organization interested in reducing anxiety of employees would be to offer these two CAM modalities in their designated relaxation room.

Conclusion

College students are struggling to be successful due to experiencing debilitating anxiety symptoms (Ratansiripong et al., 2012). College student anxiety is an epidemic

that is interfering with academic performance and overall quality of life (Oman et al., 2008; Ratansiripong et al., 2012; Strine et al., 2008). The American College Health Association (2015) reported that 53.5% of college students reported experiencing high or extreme levels of stress. High levels of stress affect college students psychologically, socially, and academically (Kang et al., 2009; Ratansiripong et al., 2010). The number of college students seeking mental health treatment at college has increased over the past 10 years (ACHA, 2015; Henriques et al., 2011; Oman et al., 2008; Ratansiripong et al., 2012). Basak and Hansda (2016) reported that approximately 11% of college students are seeking professional help at college counseling centers to manage anxiety symptoms. Some of the common symptoms experienced include feeling numbness or tingling, hot, shaky, nervous, dizzy or lightheaded, and afraid, as well as an inability to relax, trouble sleeping, fears of death, choking, losing control, or that the worst thing will happen, and physical symptoms like rapid heartbeat, trembling hands, difficulty breathing, flushed face is flushed, and/or hot or cold sweats (Beck et al., 1988).

Several treatment strategies, supported by evidenced-based research, successful at decreasing anxiety symptoms include cognitive behavioral therapy (CBT), psychotropic medication, mindfulness-based cognitive therapy (MBCT), and CAM. CBT and medication are the prescribed treatment of choice for mental health professionals; however, there is a lack of empirical research supporting the treatments' effectiveness among the college student population. Medication, CBT, as well as MBCT, all need trained professionals to administer the treatment, making them less accessible and less affordable treatment options for college students. Both accessibility and affordability

have been found to be barriers as to why college students do not seeking treatment (Ratansiripong et al., 2012).

CAM has been growing in usage as a popular treatment strategy for anxiety; however, it is considered understudied among college students who experience anxiety symptoms (LaCaille & Kuvaas, 2011). Though traditional counseling methods are effective in helping college students balance stress and anxiety symptoms (Ahmed & Westra, 2009; Westra & Dozois, 2006), other studies suggest there may be other, more effective treatment strategies for college student anxiety (Caldwell et al., 2011; Henriques et al., 2011; LaCaille & Kuvaas, 2011; Nowak et al., 2015; Oman et al., 2008; Ratanasiripong et al., 2012; Synovitz et al., 2006). LaCaille and Kuvaas (2011) suggested that some college students seek out and use CAM practices as a way to manage anxiety symptoms.

Empirical research supports the effectiveness of CAM modalities, yet there is little research on how colleges are providing these services to students (Mhatre et al., 2011). Additionally, there is a lack of empirical evidence to support that college campus counseling centers are using CAM strategies to treat anxiety disorders. There is also a lack of empirical evidence on if CAM is as effective as traditional and conventional modes of treatment. The purpose of the current study was to address these critical gaps by examining the utilization of CAM practices by students on a college campus as a strategy to reduce anxiety symptoms.

College campuses provide an opportunity for college mental health professionals to address anxiety in young adults, which Hunt and Eisenberg (2010) suggested is one of the biggest public health problems in America. Mental health is the foundation for

academic success and the general well-being of college students (Hunt & Eisenberg, 2010). CAM practices have shown mental health benefits for some college students and may alleviate anxiety symptoms (Hunt & Eisenberg, 2010; Johnson & Blanchard, 2006; Ratansiripong et al., 2012). The results from this study provide evidence that providing CAM modalities on college campuses can be an effective and affordable response to college student anxiety (Hunt & Eisenberg, 2010).

In summary, anxiety is prevalent in traditional-aged college students in the United States and is on the rise within this student population (ACHA, 2016; Grasgreen, 2011; Henriques et al., 2011; Hunt & Eisenberg, 2010). There are several factors contributing to anxiety symptoms amongst the college student population, and there is a need for accessible and affordable treatment approaches in order to combat this public health issue (ACHA, 2016; Basak & Hansda, 2016; Beiter et al., 2015; Zivin et al., 2009). Traditional college-aged students, between 18 and 24, are at the prime time in the human lifespan for first onset of a mental disorder, with anxiety disorders being one of the most commonly diagnosed during this time (APA, 2015; Beiter et al., 2015; Zivin et al., 2009). If anxiety symptoms are left untreated within the college student population, the symptoms can be prerequisites for developing an anxiety disorder, which in turn can negatively affect a student's social, financial, and academic outcomes (ACHA, 2016; Beiter et al., 2015; Zivin et al., 2009).

This study's findings indicate that access to CAM modalities on college campuses provides students with an opportunity to treat anxiety symptoms holistically (Ratansiripong et al., 2012). CAM modalities could serve as a preventative measure for college students who have state and/or trait anxiety. The findings in the current study

provide evidence-based research on which CAM modalities college students prefer and that CAM modalities do reduce state and trait anxiety symptoms in some college students. Based on the results of this study, more colleges and universities need to provide relaxation rooms that offer CAM modalities, such as massage chairs and aromatherapy, in order to improve the health and well-being of college students. Colleges and universities that choose to construct designated relaxation rooms will be investing in an initiative that will reduce anxiety symptoms, and in turn improve the mental health of campus communities.

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Appendix A

Flyer

PARTICIPANTS NEEDED FOR RESEARCH IN TREATING COLLEGE STUDENT FEELINGS OF ANXIETY

The researcher is looking for students to take part in a study about treating college student feelings of anxiety. Examples of common symptoms could be feeling stressed, overwhelmed, trouble sleeping, and you just can't stop worrying.

As a participant in this study, you will be asked to:

- Attend a 60-minute session in the Renew room
- Complete 2 surveys before the session, and 2 surveys after the session.

Participants must be enrolled at The University and be between the ages of 18 and 24. You do not need to experience anxiety symptoms, or have a diagnosed anxiety disorder, in order to participate. All students at The University, between 18-24 years of age, are encouraged to participate!

There is no cost to participate in this study!

In appreciation of your time, you will be entered into a drawing, with fifteen chances to win a \$25.00 VISA Card!

**This study has been reviewed and approved by St. John Fisher College, as well as,
The University's Institutional Review Board.**

Appendix B

Student Letter

Dear Student,

Please allow me to introduce myself. My name is Hollie Hall and I am a doctoral student in the Executive Leadership Program in the School of Education at St. John Fisher College in Rochester, New York. I am evaluating the usefulness of certain treatments such as massage, aromatherapy, and biofeedback, in helping college students cope with the stressors of college life.

If you choose to participate in the study you will be asked to do the following:

1. Schedule and attend a 90-minute appointment in the Renew room
2. Complete a demographic survey
3. Complete a survey asking you to identify any common college student difficulties before and after your time in the Renew room
4. Complete a complementary and alternative medicine survey about what modalities you preferred in the Renew room.

If you are interested in participating please complete the attached consent form which includes the steps you will need to follow, and return the consent form in a sealed, self-addressed envelope that has been provided in the packet. Once your consent form is reviewed, the researcher will contact you to schedule a 90-minute session in the Renew room.

If you have any questions about the study please contact me at (607) 587-4201. If I do not answer, please leave a voicemail with a number so that I can return your call. Thank you for your time and effort.

With Gratitude,
Hollie Hall
Research Investigator
(607) 587-4201
hmh02901@sjfc.edu

Appendix C

Informed Consent Form

Participant# _____

St. John Fisher College's INFORMED CONSENT FORM

Title of study: Is Complementary and Alternative Medicine Effective at Altering College Student Anxiety?

Name of researcher: Hollie Hall

Faculty Supervisor: Dr. Shannon Cleverley-Thompson Phone for further information: (585) 377-7751

Purpose of study: The purpose of the study is to examine if complementary and alternative medicine modalities are effective at helping students cope with the stressors of college life.

Place of study: The University Length of participation: 90 minutes

The study will examine if the use of complementary and alternative medicine (CAM) modalities results in a change in self-reported anxiety symptoms. Alfred State has three relaxation rooms that includes CAM modalities such as aromatherapy, biofeedback training, guided meditation, and massage chairs. The CAM practices that will be used in the study are located in the room referred to as the Renew room, and is located in the wellness center on campus. To be a participant you need to be a traditional-aged (18 to 24 years of age) college student enrolled at The University. This informed consent form has your Participant Number located in the top right corner. This number is how you will identify yourself during the study.

Your participation in this study is voluntary: If you choose to participate in this research, you may withdraw at any time. If you elect not to participate in this study or if you withdraw from participating at any time, you will not be penalized. If you choose to not complete the full hour session in the Renew room you can exit the room. The researcher will be in an office across the hall and will escort you out of the building. Your participation is very valuable and greatly appreciated. There is no risk other than you may discover that you experience common college student problems The benefit is that you may become more self-aware, learn about complementary and alternative practices, and realize you have easy access to these practices on campus at no additional cost.

Your responses are confidential: You will be assigned a participant number. This number will be how you are identified in the study and will be used on all surveys to protect confidentiality. You will use your participant number to schedule your 90 minutes session in the Renew room. The researcher will be the only person who has access to data collected that will link consent forms to participant data.

As a research participant, you have the right to have the purpose of the study, and the expected risks and benefits fully explained to you before you choose to participate. Withdraw from participation at any time without penalty. Refuse to answer a particular question without penalty. Be informed of appropriate alternative procedures or courses of treatment, if any, that might be advantageous to you. Be informed of the results of the study.

I have read the above, received a copy of this form, and I agree to participate in the above-named study. Please contact me at phone number _____ to schedule the 90-minute session in the Renew room.

Print name (Participant) Signature Date

Hollie Hall _____
Print name (Investigator) Signature Date

If you have any further questions regarding this study, please contact the researcher listed above.

If you experience emotional or physical discomfort due to participation in this study, please contact the wellness center, at The University by phone at 6075874201 or by email at: healthandwellnessservices@alfredstate.edu.

The Institutional Review Board (IRB) of St. John Fisher College has reviewed this project. For any concerns regarding this study and/or if you experience any physical or emotional discomfort, you can contact Jill Rathbun by phone at 585.385.8012 or by email at: irb@sjfc.edu.

Appendix D

Demographic Survey

Your Participant Number is _____.

1. What is your gender?
 - Male
 - Female
 - Other, if so how do you identify? _____

2. What academic year are you?
 - Freshman
 - Sophomore
 - Junior
 - Senior

3. Have you attended college anywhere other than this college?
 - Yes
 - No

4. What year were you born? _____

5. Which race/ethnicity best describes you? (Please check only one)
 - American Indian or Alaskan Native
 - Asian / Pacific Islander
 - Black or African American
 - Hispanic American
 - White / Caucasian
 - Multiple ethnicity / Other (please specify)

6. Which best describes your residence:
 - Commuter
 - Residential Student

7. What range does your cumulative GPA fall in?
 - 0 to 1.49
 - 1.5 to 1.9
 - 2.0 to 2.49
 - 2.5 to 2.99
 - 3.0 to 3.49

- 3.5 to 3.99
- 4.0 to 4.49

8. Have you visited the Renew room before?

- Yes
- No

9. If yes, how many times have you “used” the Renew room since September 2016?

- 1
- 2-3
- 4-7
- 8 or more

10. Have you ever used the Renew room to reduce your stress level?

- Yes
- No

Appendix E

CAM Usage Survey

Your Participant Number is _____.

1. What CAM modalities did you use today? Check all that apply.
 - Massage chair
 - Wild Divine
 - Audio Library
 - Multi-Spectrum Lamp
 - Aromatherapy
 - Face massage

2. On a scale from 1 to 10, what CAM modalities did you enjoy the most? 1-3 did not enjoy, 4-7 somewhat enjoyed, 8-10 enjoyed very much
 - _____ Massage chair
 - _____ Wild Divine
 - _____ Audio Library
 - _____ Multi-Spectrum Lamp
 - _____ Aromatherapy
 - _____ Face massage

3. Were there any modalities you wanted to use but ran out of time? Check all that apply.
 - Wasn't interested in using any modalities longer
 - Enough time using all modalities
 - Massage chair
 - Wild Divine
 - Audio Library
 - Multi-Spectrum Lamp
 - Aromatherapy
 - Face massage

4. Did you have any problems using any of the following devices? Check all that apply.
 - Massage chair
 - Wild Divine
 - Audio Library
 - Multi-Spectrum Lamp
 - Aromatherapy
 - Face massage
 - I did not experience any problems using the devices listed above.

5. Based on your experience in The Renew room, how likely are you to return at a future date?
Check best response for you
 - Definitely will
 - Probably will
 - Might or might not
 - Probably will not
 - Definitely will not

6. Overall, how satisfied were you with your experience in the Renew room today?
- Not at all satisfied
 - Somewhat satisfied
 - Satisfied
 - Very satisfied