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## The Implications of Yoga as a Coping Mechanism for Stress During the Covid-19 Pandemic

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To the Graduate Council:

I am submitting herewith a thesis written by Ellie Hunter Madenberg entitled "The Implications of Yoga as a Coping Mechanism for Stress During the Covid-19 Pandemic." I have examined the final electronic copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science, with a major in Recreation and Sport Management.

Jason L. Scott, Major Professor

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Accepted for the Council:

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Vice Provost and Dean of the Graduate School

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THE IMPLICATIONS OF YOGA AS A COPING MECHANISM FOR STRESS  
DURING THE COVID-19 PANDEMIC

A Thesis Presented for the  
Master of Science  
Degree  
The University of Tennessee, Knoxville

Ellie Hunter Madenberg  
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## Abstract

The Covid-19 pandemic has been extremely devastating across the globe. In the United States specifically, Covid-19 has taken over 545,000 lives and climbing. Over the past year of the pandemic, the rate of mental health concerns has grown significantly. Yoga has been paralleled in growth throughout the course of pandemic with countless new yoga students and advanced students who have dove deeper into the yoga practice.

The study examined the perceived stress levels of yogis and using yoga as a leisure coping strategy for stress reduction during the Covid-19 pandemic. A survey was sent via email to yoga instructors known by the researcher. The survey was also posted on five different yogi Facebook pages. 67 completed surveys were received and analyzed using various statistical tests.

The quantitative results were analyzed by descriptive statistics, single sample, and independent sample t-test, cohen's d, and correlations. The tests were conducted to compare the results of the Perceived Stress Scale (PSS) and the Leisure Stress Coping Scale (LCSS) with days practiced weekly, level of practice, and years of practice.

The results showed a benefit to using yoga to reduce stress in yogis during the Covid-19 pandemic. Yoga was also found to be beneficial for coping with stress and stress related symptoms during the Covid-19 pandemic.

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## Chapter 1: Introduction and General Information

The Covid-19 pandemic has had a devastating effect on the United States with approximately 30 million reported cases and over 545,000 deaths (CDC, 2021) in the United States. According to the World Health Organization (WHO) timeline of Covid-19, in December 2019, there was a “reported cluster of atypical pneumonia cases from Wuhan, China” (WHO, 2020 p.1). In early January 2020, the cases were reported by “Chinese health authorities that the pneumonia was caused by severe acute respiratory syndrome (SARS-CoV-2) better known now as, the novel coronavirus” (WHO, 2020, p.1). On January 31, 2020 the Covid-19 outbreak was classified as a public health emergency (CDC, 2020). As international travel continued, Covid-19 was officially declared a pandemic on March 11, 2020 (WHO, 2020).

Throughout mid-March and early April of 2020, states across the United States began to implement strongly suggested stay-at-home orders to reduce the transmission and contamination of Covid-19 through face-to-face contact (CDC, 2020). By June 2020, mask requirements and social distancing became mandatory throughout most states in public spaces to potentially prevent the spread of the virus (CDC, 2020).

The various nationwide shutdowns, stay-at-home orders, business, and school closures caused a tremendous amount of stress for many citizens (Zhai, et al., 2020). The effects of the stay-at-home orders coupled with restrictions on large gatherings (5+ individuals) and being strongly encouraged to limit personal contact to only within the household has resulted in a rise of mental health concerns such as stress among individuals (Zhai, et al., 2020). As closures continued, many stress reducing recreation and leisure activities such as yoga/mindfulness, tourism, social gatherings, indoor gym/studio activities were limited in scope and capacity.

The negative psychological effects of stress from the Covid-19 stay-at-home orders began to rise. Individuals had to become creative towards independent recreation and leisure routines to stay physically active and psychologically stimulated (CDC, 2020). A great option for relief and organized programming under the supervision of a certified therapeutic recreation specialist, is recreational therapy. Many individuals could have also utilized recreational therapy; a multidimensional treatment process for individuals with all types of health concerns including stress (ATRA, n.d.). Recreational therapy uses one's recreation and leisure interests as a modality for healing any physical, mental, or emotional injury or disability (ATRA, n.d.). Similarly, to most businesses and health related occupations, virtual events kept recreational therapy patients active and within a community during the pandemic (ATRA, n.d.). Due to recreational therapy's multifaceted approach to healing, there are numerous different facilitation techniques to improve the quality of life. In recent years, yoga has become a leading treatment for physical and mental health concerns within recreational therapy due to yoga's homeopathic approach to the spiritual mind and body as one (Wiles, 2019).

Yoga originated in India over five thousand years ago to promote optimal physical and mental well-being along with the alleviation of suffering from day-to-day life (Gard et al., 2014). The Sanskrit word yoga, meaning union or to harness, in one interpretation that acknowledges the unification of the entire self as one conscious being (Pankhania, 2005). However, in the modern western world, yoga is more focused on postures (asanas), breathing (pranayama), and some meditative practices that were first written by Patanjali Maharishi over 2,000 years ago. However, none of which included physical postures at the time (Gard et al., 2014). Patanjali's contribution became known as the Yoga Sutras of Patanjali that still flourish in yoga practices around the world today (Satchidananda, 1978). Globally, yoga is considered a stress-relieving

mechanism that integrates all physical, mental, and spiritual components of an individual to attain a state of union in the body (Barnes et al., 2019). Due to the benefits of yoga, the practice has become increasingly popular during the Covid-19 pandemic to prevent and lessen the effects of mental health concerns (Pal & Gupta, 2020).

### **Problem Statement**

As a result of the ongoing pandemic, lengthy stay-at-home orders, mask mandates, fear of the unknown, stress levels of individuals may have increased (Xiong, et al., 2020). In addition, people have been strongly advised by the Centers for Disease Control and Prevention (CDC) to work remotely, learn virtually, along with numerous other consequences of the virus. The study explored stress and stress symptoms through the lens of a yogi during the Covid-19 pandemic.

### **Purpose**

The current purpose of this study is two-fold: (1) The study examined the perceived stress levels of yogis and stress related symptoms specifically during the Covid-19 pandemic. Additionally, (2) the study explored yoga as a leisure coping strategy for stress reduction. The researcher sought to explore the benefits of yoga on the well-being of participants concerning the reduction of stress symptoms during the Covid-19 pandemic.

### **Significance of the Study**

While there is a significant amount of research about the psychological benefits of yoga, little is known about the reduction of stress specifically during the Covid-19 pandemic. The significance of this study is to address the stress-relieving efficacy of yoga during the Covid-19 pandemic.

## Research Questions

**RQ1: What are the perceived stress levels of yogis?**

**RQ2: Are there differences in perceived stress levels of yogis?**

**RQ3: Is yoga a beneficial leisure coping strategy?**

**RQ4: Are there differences in leisure coping strategies of yogis?**

## Limitations

One limitation is the homogeneity of the sample. Participants were affiliated with the yoga community and/or members of several Facebook groups. Furthermore, a sample should be taken from individuals who are not affiliated with the yoga community to better understand the benefits on individuals who are actively practicing.

## Delimitations

The scope of the study aims to identify the benefits of yoga and the stress levels of yogis during the Covid-19 pandemic.

## Definitions

**Covid-19 pandemic:** Covid-19 or Coronavirus disease, began in Wuhan, China, December 2019. The disease was classified as a severe acute respiratory syndrome that led to pneumonia (WHO, 2020). Covid-19 spread rapidly by droplets of saliva in the air (WHO, 2020).

**Quarantine/Isolation:** Quarantine is designated for individuals who have potentially been infected with a certain disease (WHO, 2007). Isolation is determined by medical professionals who have deemed and individual already infected with the disease (CDC, 2020).

**Mental Health:** Mental health encapsulates emotional, psychological, and social well-being (Ross, 2018).

**Stress:** Stress is defined as an external negative affect on an individual with varying degrees of experiences and traumas (Ross, 2018).

**Coping:** A behavior(s) used to productively handle a difficult or adverse situation (Wechsler, 1995).

**Leisure:** A freely chosen and intrinsically motivated experience; relaxation or recreation (Janicka-Panek, 2017).

**Leisure Palliative Coping:** “An escape-oriented coping strategy. Leisure keeps people’s minds busy, and they temporarily escape from stressful events through leisure” (Iwasaki & Mannell, 2000 p.168).

**Yoga:** Yoga is based in ancient Indian and Hindu practices based on meditation, *asana* (the physical postures), *pranayama* (different breathing traditions and techniques as well as stretching and relaxation of the muscles) (Kupersmidt & Barnable, 2019).

## Chapter 2: Review of Literature

### The History of Yoga

The beginnings of yoga can be traced back to over 5,000 years, with the Indus Valley civilization (Basavaraddi, 2015). Numerous different fossils and symbols have been discovered that suggests the practice of yoga in ancient India could have been around even longer (Basavaraddi, 2015). The Dharmic tradition is believed to have begun with a combination of Asian traditions which included Vedic, Upanishadic, Buddhist, Jain, Darshana, Mahabharat, and Ramayana, as well as Shaiva, Vaishnavism, and Tantric (Basavaraddi, 2015). Kumar & Pradhan, (2017) explored the South Asian origins of yoga comprised the pre-modern version of yoga to encompass mystical traditions that used sacrificial ideals, internalized self-knowledge, action, and wisdom to achieve the stage of enlightenment or pure bliss (*samadhi*). The word yoga was first used in an ancient Indian text called the Rig Veda that was used by Vedic Priests. The texts were comprised of rituals, chants, and mantras that were slowly consummated and documented in the over 200 Upanishad scriptures (Kumar & Pradhan, 2017) to develop into classical yoga today.

Although the pre-classical version of yoga was practiced for thousands of years, the various beliefs and ideals needed a more consistent and unified presence in the Hindu culture. The pre-classical version is now called Raja Yoga is based on The Yoga Sutras of Patanjali. Patanjali was a man or spiritual-being who was believed to have lived around 2,300 years ago (Basavaraddi, 2015). The eight limbs allowed there to be stages to accomplish in the path towards enlightenment. In the first stage, *Yama* is devoted to social constructs meaning “to control” or “to contain” (Hemingway, 2010, p. 7-8). Within the first stage, there are five components. *Ahimsa*, “nonviolence” or “non-harming”, *Satya*, “truthfulness”, *Asteya*, “non-

stealing”, *Brahmacharya* “honoring yourself and others”, and *Aparigraha*, “non-covetousness” (Hemingway, 2010, p. 7-8). The second limb, *Niyama*, is devoted to influencing one to control individual behavior or self-discipline (Satchidananda, 1978). *Niyama* also has five stages. The first *Saucha* “purity of the body and mind”, *Santosa* “contentment with where and how things are in your life today”, *Tapas* “disciplined commitment”, *Svadhyaya* “self-study”, and lastly, *Ishvarapranidhana*, “letting go of the ego” (Hemingway, 2010, p. 8-9). The next three stages, *Asana*, *Pranayama*, and *Pratyahara*, direct certain control over the physical body with physical postures, breathwork, and release of external distractions, respectively (Satchidananda,1978). The last three stages, *Dharana* “focused concentration”, *Dhyana* “body-breathe-mind become one, a state of awareness”, and finally *Samadhi* “pure bliss” include specific practices to control one’s mind (Hemingway, 2010, p. 11-12).

The term *yoga* or *yog*, meaning to unite or to harness, traditionally refers to the stability and consciousness of the mind (Satchidananda, 1978). Therefore, the practice of yoga according to Patanjali’s sutras is based on the control of one’s mind and all senses that are encompassed within (Satchidananda,1978). 196 yoga sutras are broken down into four main portions: *Samadhi Pada* (contemplation), *Sadhana Pada* (practice), *Vibhuti Pada* (accomplishments), and *Kaivalya Pada* (absoluteness) (Satchidananda, 1978). The ultimate goal of yoga is freedom, a cosmic state of being, a spiritual being so enveloped in the absoluteness of yoga that reality does not influence the soul (Satchidananda, 1978). While not much is known about Patanjali himself, his legacy of the Yoga Sutras is still present and has significant meaning in yoga practices today.

Although yoga is based on control over the mind, most people in the United States know yoga only through the third limb *asana* (the physical practice) because yoga has progressed and developed into teachings through the physical body for the mind. Including numerous different

practices such as, *Bikram, Baptiste, Ashtanga, Vinyasa, Yin, Hatha, Iyengar, Kundalini, Tantra, and Anusara*. From the practices, yoga has branched out further using more props and even partners. The evolution of the physical expressions is now known as versions of the ancient East Indian tradition.

### **Yoga in the United States**

Yoga first made an appearance in the United States in the 1800s (Douglass, 2007). As the East Indian and the more Judeo-Christian Westernized culture were introduced, there was a significant amount of backlash, as most Americans believed that the Hindu/Yogic philosophy challenged the religious beliefs of western society (Douglass, 2007). At the World Parliament of Religions in Chicago, 1893, a man named Swami Vivekananda revolutionized the practice of yoga around the world by giving a speech that relieved the fears of Americans about yoga and religious associations (Deslippe, 2016). While Vivekananda's mastery of the subject brought fascination to American academics and medical professionals, the group still viewed yoga as challenging to certain religious beliefs (Aravamudan, 2001). As time progressed through the 1940s, academics still believed the idea of yoga in America was based on mystical witchcraft rather than the Dharmic tradition (Lanman, 1917).

In the latter part of the 1940s, Carl Jung attempted to bridge the gap between Eastern and Western beliefs trying to connect aspects of Christianity with ideals of yoga (Jung, 1999). While the attempt was unsuccessful, by the 1950s the division of East and West began to disintegrate and academics finally started to gain interest in the study of yoga (White, 1956). By the 1960s and 1970s, the popularity of yoga grew immensely in western culture especially with the influence of icons such as Carol King and The Beatles (Douglass, 2007). Again, this era created separation due to individuals' association with popular culture; sex, drugs, and rock and roll



(Douglass, 2007). However, in the late 1970s academics began to explore the compliments of yoga as a tool for psychological practices (Coward, 1979).

As yoga became more mainstream and researched in the biomedical field in the 1990s, the correlation between religion and mysticism was fading, while the association with prolonged life, physical, and mental health grew (Douglass, 2007). Americans felt comfort in the research of the medical field to ensure yoga is backed by science, not only ancient practices. Yoga challenges one's self-identification and spirituality to achieve eternal liberation and peace. More recently, yoga has developed into a form of psychological, emotional, and physical therapy in a personalized setting to unite all aspects of the individual's body after or in the prevention of trauma (Bhavanani, 2016).

### **Brief History of Recreational Therapy**

Recreational therapy came to be a profession around the time of World War II in the 1940s and '50s. Red Cross workers attempted to aid veterans returning from the war that were desperate for help to reintegrate back to life at home (Austin, 2004). As the profession began to grow and expand outside of military hospitals, programs were established for individuals with mental disabilities as well (Austin, 2004).

Recreational therapy uses a strength-based approach as a theoretical framework for positive practice on all populations to obtain an effective level of wellness (Austin, 2013). The goal of recreational therapy is to empower individuals, as well as improve quality of life, and enhance access to leisure and recreational experiences (ATRA n.d.).

Recreational therapy is known to enhance, maintain, and heal an individuals' quality of life concerning certain health conditions (Austin, et al., 2017). To achieve a positive quality of life, recreational therapy uses numerous different facilitation techniques including "physical

activity and fitness, emotional expression and control, cognitive stimulation and well-being, and educational and adaptation strategies” (Dattilo & McKenney, 2016, p. VII-VIII). Within the facilitation techniques, are a multitude of different treatment modalities including “adventure therapy, aquatic therapy, other team and individualized sports, martial arts, leisure education, expressive art, stress management, and yoga and mindfulness” (Dattilo & McKenney, 2016, p. VII). While all the modalities listed are used within different disciplines, yoga and meditation can be used across a wide variety of populations due to the leisure-based vastness and benefits on physical, psychological, and emotional health.

### **Leisure-Stress Coping Conceptual Framework**

Leisure is based on the individuals' state of mind and being (Crowe et al., 2016). Identified as many different definitions as possible, a group or individualized activities, at a specific place, time, location, etc. Leisure is defined differently for everyone. However, what does remain the same within the individual is the intrinsic motivation and choice to participate, along with the reflection of the participants' time and growth for future participation (Crowe, et al., 2016). Iwasaki & Mannell's (2000) conceptual framework for Leisure-Stress Coping (LSC), as shown in Figure 1, identifies the use of purposeful leisure to lessen the effects of stress while also restoring the individual to a more sustainable mental and physical state. Within the LSC framework, Iwasaki & Mannell (2000) identified three coping mechanisms to enhance the processing of stressors through leisure coping strategies and two leisure coping beliefs.

The first leisure coping strategy is *leisure palliative coping* (Iwasaki & Mannell, 2000), a brief escape that allows the release of the stressor(s) augmented by a period of recuperation to address the stressor(s) more efficiently (Crowe et al., 2016). Whether mental or physical, leisure palliative coping suggests fully participating in a leisure activity to relieve certain stressors.

While after, making sure to give the body time to rest to absorb and reflect on the stressors. For example, a physical yoga practice can release different emotions based on certain postures (Satchidananda, 1978). The final resting pose, *savasana*, allows the individual to process certain emotions.

*Leisure mood enhancement* (Iwasaki & Mannell, 2000) suggests leisure and recreation can be restorative in the promotion of positive attitude and emotions when dealing with a stressor(s) (Kleiber et al., 2002) In other words, leisure mood enhancement does not mean an individual needs to go to the gym every day. The individual can participate in a gentle or chair yoga class that does not put the body through copious amounts of pressure and harsh conditions. Yoga can be extremely restorative in dealing with and processing physical and psychological emotions leading to a more positive attitude (Satchidananda,1978)

Finally, *leisure companionship* (Iwasaki & Mannell, 2000) indicates the individual can and should seek out companionship with similar individuals to have a more supportive and connected leisure experience (Crowe et al., 2016). Leisure companionship suggested that not all leisure experiences need to be pursued and practiced individually. Leisure companionship allows the individual to connect to others while also participating in something enjoyable. Throughout the Covid-19 pandemic individuals searched for companionship through any outlet due to restrictions and stay-at-home orders. When most workout facilities were closed, the yoga community gave individuals the ability to participate in yoga through different modalities. Including, outside in a group setting, virtually, through live or pre-recorded classes, one-on-one with a private yoga instructor, or practicing alone.

The LSC framework focused on leisure coping beliefs suggesting the importance of *leisure autonomy* that consists of *self-determination* and *empowerment* (Iwasaki & Mannell,

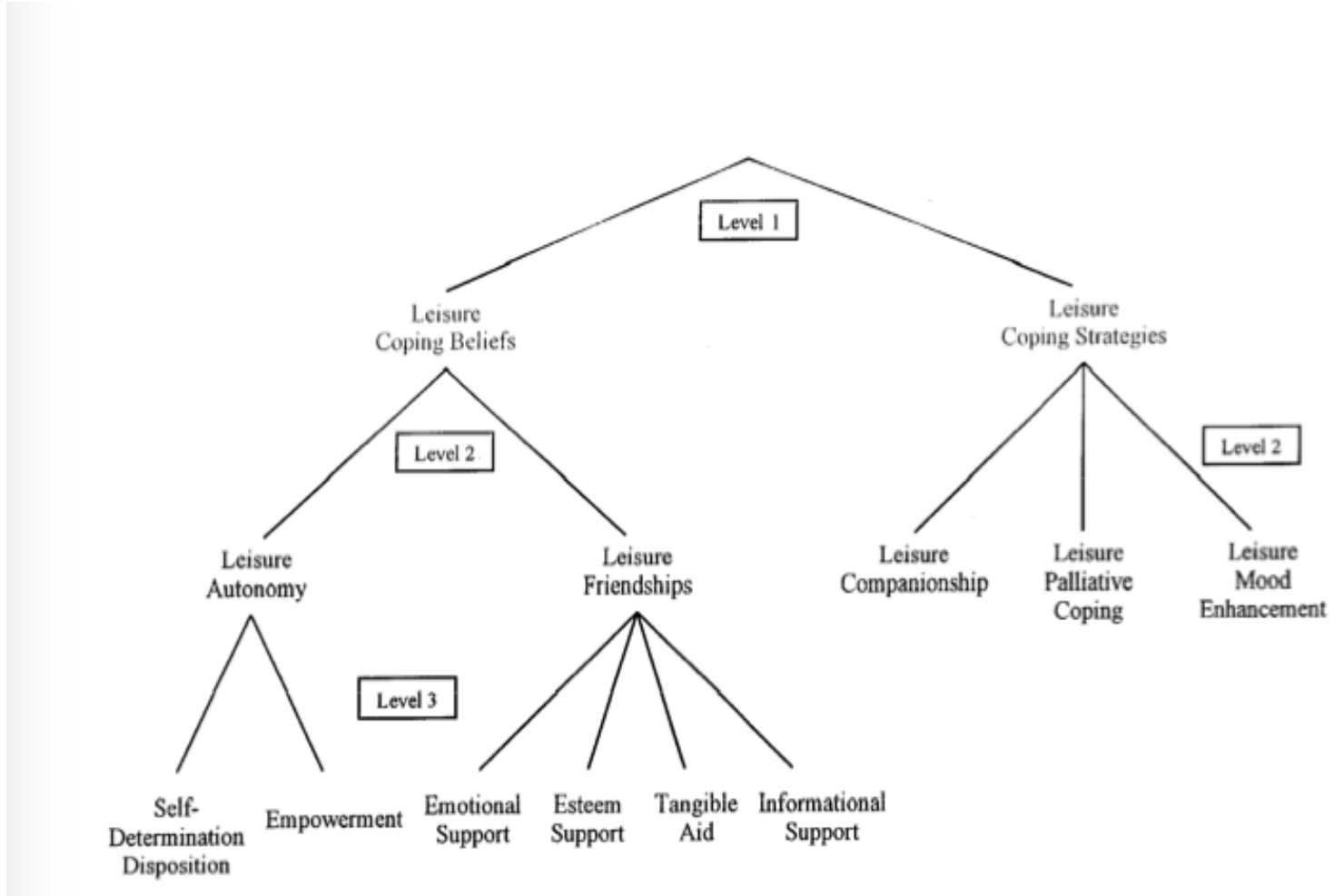
2000). The ability to choose reduces stress and improves overall health by valuing the individual's challenges and daily difficulties. While also realizing the benefits to the sense of self to overcome such endeavors.

On the contrary, *leisure friendships* revolve around social support rather than the intrinsic motivation of *leisure autonomy*. The framework includes *emotional support*, *esteem support*, *tangible aid*, and *informational support* (Iwasaki & Mannell, 2000). Emotional and esteem support typically come from a friend or family member that understands the stressors that are occurring (Iwasaki & Mannell, 2000).

Emotional support is typically beneficial after a significant trauma, for example, an unexpected death or the betrayal of a spouse (Iwasaki & Mannell, 2000). Whereas esteem support is used to help build back self-confidence after the loss of a job or failure to reach a certain goal (Iwasaki & Mannell, 2000). Emotional and esteem support show empathy and understanding throughout difficult periods and situations in life. Conversely, tangible aid refers to more physical support than emotional (Iwasaki & Mannell, 2000). For example, helping a friend with car troubles or getting through a break-up. Informational support is knowledge-based (Iwasaki & Mannell, 2000), meaning teaching that friend how to fix the car for next time or offering a place to stay (Iwasaki & Mannell, 2000). This type of support could be physical or emotional, therefore sharing knowledge with the people around you to help the individual grow in the future bears significant importance.

### **Yoga and Leisure Stress Coping Framework**

Stress is defined as a real or perceived internal or external stimuli that affects ones physical and/or emotional stability (Gerrig & Zimbardo, 2004; Ross, 2018).



**Figure 1**

*Leisure-Stress Coping Framework*

Stress can interrupt one's ability to compartmentalize proper responses to that stimuli and intrude on one's perceptions of normalcy and stability (Gerrig & Zimbardo, 2004). Similarly, coping is an individual's internal mechanism to handle internal or external stressors to return the body to a natural state of equilibrium (Lazarus & Folkman, 1984). The literature for yoga as a coping mechanism supports the LSC framework by utilizing yoga for the brief relief from a stressor to enhance the individual's mood, and eventually allow that individual to participate in a multi-person class and/or become part of the yoga community.

Yoga is widely used across multiple mental and physical health disciplines. In a positive affect study on using yoga as a coping mechanism, Kiecolt-Glaser et al. (2010) recruited 50 healthy women ages 30-65. The women were evenly divided into novice yoga students and expert yoga students based on frequency and duration of practice. The participants scheduled three visits at least two weeks apart for six hours at a time. The participants were put through three interventions: movement, video, and yoga. The study found yoga had a more significant impact on the physical and psychological effects of novice yogi's rather than the advanced yogis.

In another study, menopausal female participants ages 40-65 engaged in a twice a week Iyengar-based yoga practice for ten weeks (Crowe et al., 2019). The results suggest that yoga as a coping mechanism for menopausal women is beneficial for palliative coping, as the time participating in yoga was the only opportunity the women had for themselves (Crowe et al., 2019). Yoga enhanced the participants mood because the practice allowed time for the women to internalize strength and be selfish to better the mind and body (Crowe et al., 2019). Finally, yoga gave the participants companionship and social support as each class was done in a group setting (Crowe et al., 2019).

Crowe et al. (2019) study, the practice of yoga in a community setting increases the leisure friendships within studios and classes, therefore promoting participation, growth, and overall health and wellness. Yoga also promotes leisure autonomy by enhancing intrinsic motivation and empowering individuals to keep attending classes to grow the practice. Due to the path given in Patanjali's Yoga Sutras, the encumbrance of yoga is based on complete autonomy to follow the eight steps towards enlightenment (Satchidananda, 1978). The LSC framework allows individuals to cope with stressor(s) successfully (Iwasaki & Mannell, 2000).

### **Yoga and Stress**

Previous research suggests the practice of yoga can reduce the load of allostatic stress and return the body to a more balance state (Streeter et al., 2012). The allostatic stress load occurs when the body is continuously trying to return itself to homeostasis over long periods of time based on perceived threats to (McEwen, 2007). Stress is thought to have negative effects on every major system in the body (Streeter et al., 2012). The results are an imbalance in the autonomic nervous system (ANS) which can lead to fight or flight responses in the sympathetic nervous system (SNS) (Streeter et al., 2012). Lastly, an underactivity of the neurotransmitter gamma amino-butyric acid (GABA) can aid the allostatic stress load (Streeter et al., 2012).

Studies propose yoga-based treatments have the potential to level out the systems to a homeostatic state. A meta-analysis by Streeter et al., 2012, demonstrated that yoga decreases SNS activity and increases GABA, therefore, yoga may be a treatment appropriate for individuals who have tried and failed with pharmacologic drugs or who would rather take a more holistic approach (Nemeroff et al., 2006). Another study on the 2004 tsunami in Southeast Asia revealed that an eight-hour pranayama intervention over the course of one week, showed the signs of stress related disorders had decreased (Descilo et al., 2009).

While stress is a psychosomatic concern, yoga can be used to compliment other therapies, as well as preventative care (Bhavanani, 2016). Due to the high stress nature of university programs, stress management courses have been offered across several universities to help students reduce stress and anxiety throughout the semester (Milligan, 2006). As the study of yoga in America progressed, most stress management programs include a yoga and meditation regiment to enhance overall wellness (Milligan, 2006).

One study compared Kundalini yoga with cognitive behavioral therapy (CBT) (Granath et al., 2006). CBT is known as the “gold standard for psychotherapy” (David, et al., 2018, p.1). CBT is a psycho-social form of therapy used to manipulate maladjusted ways of thinking and behaviors (Hofmann, et al., 2013). The study yielded similar outcomes for both yoga and CBT treatment options for stress. However, more studies are needed to further explore the concept (Granath et al.,2006).

While yoga is rooted in Ancient Indian culture, much like CBT, the value on the person is the primary priority. Yoga has been used for centuries aiming to improve quality of life and relieve suffering for a lifetime and beyond (Satchidananda, 1978). The improved quality of life has led recreational and psychotherapists to utilize the benefits of yoga as a treatment modality for patients specifically with significant stress and other mental health concerns.

### **Recreational Therapy and Yoga**

In recent decades, when the medical community began studying the medical benefits of yoga, recreational therapists took advantage of using yoga as a treatment modality for individuals of all ability levels (Douglass, 2007). As the practicing yoga population grew in the United States, the therapeutic benefits became more prevalent and paved way for a more individualized approach to yoga as yoga therapy (Van Puymbroeck, et al., 2015).



The practice of yoga can take a lifetime to master (Satchidananda, 1978). Therefore, the importance of recreational therapists providing yoga-based therapy to have proper certifications and training is significant (Wiles, 2019). Without proper credentials and previous exposure to populations with differing abilities, difficulties arise when trying to use yoga as an effective intervention (Wiles, 2019). While the research-based knowledge and benefits of yoga are still expanding, the practice of yoga in recreational therapy is as well (Wiles, 2019). The literature surrounding yoga in recreational therapy does not suggest exactly how yoga is being used in practice. Therefore, more research is needed concerning yoga in recreational therapy settings to further understand the qualifications of patients and practitioners. Although, in a systematic review study on the therapeutic approach to stress through yoga, twelve of seventeen studies resulted in positive impacts on patients analyzing stress management across six countries (Sharma, 2013). The study revealed positive physical and psychological conclusions concerning stress during a yoga intervention (Sharma, 2013).

In another therapeutic study on the Veterans Affairs hospitals treating veterans with post-traumatic stress disorder (PTSD), the study found that most of the 125 programs analyzed had a yoga, meditation, and mindfulness practice for veterans (Libby et al., 2012). The study revealed that yoga as a therapy for veterans with PTSD helped improve the mental health of veterans with a person-centered approach (Libby, et al., 2012).

As stated by Bonadies (2004), "... it will only benefit recreation therapists to take advantage of a modality such as yoga to assist in the self-management of illness and disease" (p. 165). A global pandemic gives yoga-based research an opportunity to be studied across many disciplines and populations because of the impact the practice has around the world.

## **Covid-19 Quarantine and The Effects on Mental Health**

Quarantine and isolation are often used interchangeably. The word quarantine comes from the Italian word *quaranta giorni*, in the 1300's which translates to forty days (Chatterjee & Chauhan, 2020). The forty days was mandated to prevent the spread of diseases when ships docked into port. The sailors were to remain on the ship for forty days before coming ashore (CDC, 2012). The tactic has been used for centuries since to prevent and limit the transmission of infectious diseases (Hossain et al., 2020). While quarantine has been proven to be beneficial for one's ability to abstain from contracting a disease or virus, the isolation brings fear and uncertainty to one's mental health (Hossain et al., 2020). With the recent coronavirus pandemic, mass quarantine has been implemented all over the world to reduce rate and spread of infection (Brooks et al., 2020). While quarantine makes physical health a priority, mental well-being becomes necessary to persist through the unsettling times. Public health concerns arise when individuals do not have a method to cope with the effects of physical isolation. To help increase mental strength, stability, and reduce stress, Tillu et al (2020) notes that individuals have turned to the practices of yoga to return union to the physical and spiritual body.

The panic induced by Covid-19 across the globe has caused most countries to implement stay-at-home orders, some even enforced by the military. Due to forced changes in personal care routines, more individuals are becoming stressed, unable to sleep, and angry or frustrated during the Covid-19 pandemic (Zhai & Du, 2020). Others struggles include anxiety, acute stress, fear, uncertainty, irritability, emotional and mood disorders, depression or like symptoms, etc. (Usher et al., 2020). Once such feelings arise, reducing the perceptions of disease and viral threats to the physical body is extremely difficult to calm (Soule, 2020).

As the negative side effects of quarantine and social isolation persist, healthcare officials suggest filling time with various cognitive, physical, and spiritual activities to maintain mental and physical health (Chatterjee & Chauhan 2020). Through quarantine, Americans have turned to individualized physical activity that can be done at home to ease the symptoms of such mental health concerns (Chatterjee & Chauhan 2020). Mental health challenges can trigger unneeded stressors, including changes in thinking, mood, behavior, and actions in everyday life (Ross, 2018). Physical activity is one of the most effective methods of producing endorphins leading to positive mental health outcomes (Ross, 2018). Yoga is one potential outlet that may reduce the symptoms of stress and other psychological indications (Gard et al., 2014) caused by the Covid-19 pandemic.

### **Chapter 3: Materials and Methods**

The Covid-19 pandemic has been an extremely difficult time for most participants in the current study, the United States, and the global community. The current study aims to understand the perceived stress levels of yogis and to explore yoga as a coping strategy for stress reduction during the Covid-19 pandemic.

#### **Procedure**

The current study utilized a cross-sectional research design. Data were gathered via email snowball sampling using members of the yoga community through two related constructs. The first were instructors known directly by the researcher, who were registered yoga teachers (RYT) with Yoga Alliance. Yoga Alliance is an overseeing organization that provides directory and credibility to yoga schools and instructors around the country (Yoga Alliance, n.d). The teachers were asked to share the survey with yoga students through email and social media such as Facebook and Instagram. The second part of the sample came from members of yoga related Facebook groups which focused on promoting yoga before and continued throughout the pandemic. The groups allowed anyone to be part of the yoga community, whether beginners or lifetime students and teachers. The groups included “Yoga at Home”, “Yoga & Meditation”, “Yoga, Meditation, and Spirituality”, and a local Facebook group.

#### **Instrumentation**

Data were collected through a survey analysis based on The Perceived Stress Scale (Cohen, 1983) (Cronbach’s  $\alpha=.76$ ) The Perceived Stress Scale (PSS-10), in Appendix A, is a tool used for individuals to recognize how “unpredictable, uncontrollable, and overloaded” (Lee, 2012, p. 121) stress levels have become in the preceding month.

There are three versions of the PSS, however, the PSS-10 was used in this study due to its consistent validity and reliability scores (Lee, 2012). Each question in the PSS-10 was answered on a Likert scale ranging from 0 (never) to 4 (very often). This scale is measured by the sum of scores with 40 being the highest score possible. The PSS-10 identifies low (score 0-13), moderate (score 14-26), and high (score 27-40) stress participants. For the current study, the participants were instructed to base each answer selection on perceived stress levels throughout the Covid-19 pandemic. The researcher evaluated the participants stress symptoms during the Covid-19 pandemic regarding practices per week, level of practice, and years of practice over.

Data were also collected through the Leisure Coping Strategy Scale (Iwasaki & Mannell, 2000) (Cronbach's  $\alpha=.75$ ). "The LCSS measures the extent to which leisure pursuits specifically help people cope with stress" (Iwasaki & Mannell, 2000, p. 169). A modified version of the Leisure Coping Strategy Scale (LCSS), in Appendix A, was used to gauge what type of activity an individual participates in regarding free time (Jordan, 2008). The LCSS was modified by the researcher to decrease repetitive questions and increase understandability for the yogi participants. The scale measured the three coping strategies in the LSC framework: leisure palliative coping, leisure mood enhancement, and leisure companionship. For the current study, the word leisure was inter-changed with yoga. Each question in the LCSS was answered on a Likert scale ranging from 1 (very much like me) to 4 (not at all like me). The researcher evaluated the benefits of yoga as a leisure coping strategy by practices per week, level of practice, and years of practice.

For the current study three categories were examined with the PSS-10 and LCSS: Days practiced weekly, level of practice, and years of practice. Days practiced weekly was measured on a Likert scale 1 (not committed) to 7 (very committed). The category was separated into two

groups 3 or less days per week and 4 or more days per week. Level of practice is categorized by beginner, novice, intermediate, and advanced. The four categories were collapsed into two: novice and advanced to better evaluate the differences in perceived stress using the PSS-10. Years of practice was broken down into five groups, less than six months, six months to a year, one to two years, two to four years, and five or more years. To better explore the implications of a consistent practice on perceived stress the five categories were collapsed into two: one year of less and more than one year.

### **Sample**

The sample provided 67 responses from 61 women (91.0%) and 6 men (9.0%). Partial responses (N=24) were not included in this study? Surveys were distributed via email and social media outlets. Table 1 in Appendix B displays the demographic information necessary for analysis of research questions based on the survey. The sample was predominately Caucasian (N=53, 79.1%), African American (N=4, 6.0%), Pacific Islander (N=2, 3.0%), and other; Hispanic and Middle Eastern (N=8, 11.9%). Participants practiced yoga three or less times per week (N=32, 47.8%) or four or more times per week (N=38, 56.7%). The participants in the current study are also diverse in the number of years of practice. Participants who have been practicing for one year or less (N=30, 44.8%) and participants who have been practicing over one year (N=40, 59.7%).

According to the current study, yogis practiced in numerous different environments over the course of the Covid-19 pandemic. Participants practiced through many different constructs including virtually (N=49), outdoors (N=25), in studio (N=27), one-on-one (N=6), other; alone (N=8).

Finally, participants were asked if the physical distance brought higher stress symptoms. More than half (N=41, 61.2%) of the participants did not perceive a change in the sense of the yoga community, while 38.8% of participants did notice a difference (N=26) during individual practices.

### **Data Analysis**

Descriptive statistics were used to report gender, race, days practiced weekly, level of practice, and years of practice. Additionally, descriptive statistics were used to report perceived stress levels (PSS-10) and leisure coping strategies (LCSS) to determine the consistency of the PSS-10 and LCSS, Cronbach's alpha was .76 and .75 respectively. Due to the acceptable reliability of each scale, alpha if items were deleted could not be improved.

To examine differences in PSS-10 and LCSS, items 4,5,7, and 8 in the PSS-10 and items 4 and 12 in the LCSS were reverse coded to properly analyze the sample. Single sample t-tests were used to understand the mean for each survey as dependent on the participants in the current study. Cohen's d was also used with the single sample t-test as the test reveals the effect size of the test. Independent t-tests were used to analyze independent groups and determine if the associated means for days practiced weekly, level of practice, and years of practice are different from PSS-10 and LCSS. Finally, correlations were used to examine the relationship between PSS-10 and LCSS.

## Chapter 4: Results

### RQ1: What are the perceived stress levels of yogis?

#### Perceived Stress Scale

The PSS-10 (N=67, M=17.91, SD=4.73) (Table 3 in Appendix B) is a ten-item scale to measure perceived stress levels in individuals. Participants evaluated the impacts of perceived stress to understand how certain situations influence stress level. The PSS-10 was described by low (N=12), moderate (N=52), and high (N=3) stress in participants specifically during the Covid-19 pandemic. For the current study, the Cronbach's alpha of the PSS-10 was .76.

A single-sample t-test was conducted to determine whether the sample has a lower mean score than the mean of the PSS-10 itself (M=20). The sample of 67 participants revealed that the mean score decreases  $t(66) = 30.99, p < .001, d = 4.73$ . Cohen's d shows the average decrease in perceived stress in the yogi community is 4.73.

Females' stress in the current study had a wide range of low to high from 9 to 29, while males were in the moderate range, between 12 and 14, with one at high, 28. Most individuals in the current study were Caucasian female (N=51, stress range 9-29) and the male population was made up of all Caucasians (N=6). The remaining 13 women identified as African American (N=4, moderate stress 21-26) Pacific Islander (N=2, moderate stress 17-20), and Hispanic/Middle Eastern (N=8, moderate stress 14-22).

The participants who practiced virtually (N=49) displayed a wide range of stress and stress symptoms (9-29). However, the current study did not distinguish between live and pre-recorded virtual practices, which could have made a difference overall. Participants who practiced outdoors (N=25) also exhibited a wide range of stress and stress symptoms (12-28), however smaller range than virtual. There was number of participants who had the ability to



participate in in-studio classes (N=27); however, the range of stress and stress symptoms perceived by participants (9-28) remained uninfluenced. Participants who practiced in a private one-on-one setting (N=6) showed moderate ranges of stress comparatively (11-22). Finally, participants in the “other” category (N=8) mostly practiced alone had stress ranges 12-23.

### **Sense of Community**

For some yogis, the physical distance did not affect perceived stress levels or sense of a yoga community (N=26). However, for others, the physical distance did play a role in increased perceived stress levels (N=41). Individuals who perceived the sense of community changed showed an increased level of higher stress (low=3, moderate=36, high=2). Participants who did not perceive a change in the sense of community displayed lower levels of perceived stress (low=9, moderate=16, high=1). While both categories exhibited few with high levels of stress, further testing found no statistical significance.

### **RQ2: Are there differences in perceived stress levels of yogis?**

To examine differences in perceived stress levels of yogis, independent samples t-test were conducted using days practiced weekly, level of practice, and years of practice. The PSS-10 uses three ranges of perceived stress: low, moderate, and high according to responses for each question.

### **Days Practiced Weekly**

To investigate differences on levels of stress in participants based on the number of days practiced weekly, two categories were evaluated; participants who practiced three or less days per week (N=31, M=19.32, SD=5.11) and participants who practiced four or more days per week (N=36, M=16.69, SD=4.06) (Table 3 in Appendix B). Participants who practiced three or less days per week reported higher levels of stress overall (low=5, moderate=20, high=3).

Participants who practice 4 or more days per week showed lower levels of stress comparatively (low=7, moderate=29, high=0).

An independent samples t-test was conducted between the PSS-10 (dependent variable) and the number of days practiced weekly (independent variable). Levene's test for equal variances was violated ( $F=4.13$ ,  $p<.05$ ). Therefore, equal variances cannot be assumed. However, the t-test results yielded  $t(57)=2.30$ ,  $p=.03$ ,  $d=4.58$  (Table 4 in Appendix B) a statistically significant outcome between groups.

### **Level of Practice**

Level of practice (independent variable) was categorized as novice and advanced. Novice yogis, typically have little to no background knowledge or comfortability with the physical, emotional, or spiritual practice. The novice yogis ( $N=25$ ,  $M=20.92$ ,  $SD=3.71$ ) (Table 3 in Appendix B) are usually just beginning to understand the meaning of a yoga practice as whole. While advanced ( $N=42$ ,  $M=16.12$ ,  $SD=4.38$ ) (Table 3 in Appendix B) yogis tend to have a well-rounded practice, are comfortable in and out of the studio, and want to deepen the knowledge of the spiritual and emotional practice. Novice individuals had no reported levels of low stress (moderate=23, high=2). Advanced individuals had notably lower levels of reported stress (low=12, moderate=29, high=1).

Conducting an independent samples t-test, Levene's test revealed equality of variances ( $F=.10$ ,  $p=.76$ ). The t-test results ( $t(65)=4.59$ ,  $p<.001$ ,  $d=4.14$ ) (Table 4 in Appendix B) yielded a statistically significant difference between groups regarding the perceived stress levels of each. These data indicate advanced participants shows a statistically significant lower level of perceived stress during the Covid-19 pandemic.

## **Years of Practice**

Years of practice is classified by practicing yoga through any of the eight limbs. To determine potential differences, responses were categorized into one year or less of practice and more than one year of practice. The study evaluated the connection of stress perceived by participants who have been practicing one year or less (N=29, M=19.24, SD=4.21) and participants who have been practicing more than a year (N=38, M=16.89, SD=4.90) (Table 2 in Appendix B).

Participants who have been practicing one year or less of a yoga have very minimal levels of low stress (low=2, moderate=26, high=1). Participants who have been practicing over one year have significant levels of low stress (low=10, moderate= 26, high=2).

An independent samples t-test was conducted to interpret the difference between the variables. While Levene's test does not suggest equal variances (F= .00, p=.990), the t-test yielded significant results (t (64)=2.10, p=.04, d=4.62) (Table 4 in Appendix B). These data identify the group practicing for over one year showed a statically significant lower level of perceived stress regarding the number years of practice during the Covid-19 pandemic.

### **RQ3: Is yoga a beneficial leisure coping strategy?**

#### **Leisure Coping Strategy Scale**

The 13-item LCSS (N=61, M=1.83, SD=.35) in this study yielded a reliability using Cronbach's alpha=.75 and had a high association with the PSS-10 (r=-2.90, p=.023). Due to using a modified version of the LCSS, only one of the three subscales had good reliability and the other two subscales had a low Cronbach's alpha. The 5-item leisure companionship subscale had (N=61, M=1.93, SD=.55) a Cronbach's alpha of .21. The 5-item leisure palliative coping subscale (N=61, M=1.76, SD=.50) had a Cronbach's alpha of .81. The 4-item leisure mood

enhancement subscale (N=61, M=1.83, SD=.35) had a Cronbach's alpha of .26. Due to the low Cronbach's alpha for leisure companionship and mood enhancement, alpha if items were deleted were conducted to identify if reliability could be improved. Despite further testing, the Cronbach's did not improve therefore, the two subscales of leisure companionship and leisure mood enhancement could not be analyzed for additional testing. However, the entire 13-item LCSS scale and the leisure palliative coping subscale were analyzed further.

### **Sense of Community**

A correlation analysis the relationship between the sense of community (N=67 M=4.20, SD=2.10) measured by a Likert scale 1 (no sense of community) to 7 (high sense of community) and LCSS-total. Although, no statistically significant correlations were found. Correlations were conducted between the leisure palliative coping scale and the sense of community. However, no correlations of significance were found.

### **Location of Practice**

The LCSS exhibited slight differences in leisure coping. Individuals who practiced virtually (N=44, 48.4%) were most of this sample. The findings indicated participants who practiced virtually could have been practicing alone or in a group setting. Participants also practiced outdoors (N=24, 26.4%), potentially in a group setting, and in-studio (N=25, 27.5%). One-on one practice showed the least popular regarding leisure coping. Finally, very few individuals marked "other" (N=7, 7.7%) as a practice preference. This category referred to practicing alone. However, no statistically significant evidence was found.

#### **RQ4: Are there differences in leisure coping strategies of yogis?**

The 13-item LCSS and the 5-item leisure palliative coping scale was analyzed using descriptive statistics and t-tests to explore the difference in leisure coping strategies of the days practiced weekly, level of practice, and years of practice.

##### **Days Practiced Weekly**

To accurately interpret the implications of yoga as a leisure coping strategy, LCSS-total (dependent variable) was explored with the number of days practiced weekly (independent variable). The number of days practiced weekly grouping was analyzed through two categories: participants who practiced three or less days per week ( $N=26$ ,  $M=1.78$ ,  $SD=.07$ ) and participants who practiced four or more days per week ( $N=35$ ,  $M=1.87$ ,  $SD=.05$ ) (Table 5 in Appendix B). However, no statistical significance was found.

Leisure palliative coping (dependent variable) was analyzed regarding the number of days practiced weekly. Independent samples t-tests were conducted but yielded no statistically significant results. However, one question individually did bear statistically significant results, “I engage in a leisure activity to temporarily get away from the problem” ( $N=61$ ,  $M=2.02$ ,  $SD=.69$ ). Levene’s test for equality of variances can be assumed ( $F=.03$ ,  $p=.87$ ). Due to the equality of variances, the t-test results  $t(59) = -2.35$ ,  $p=.02$ ,  $d=.69$  (Table 6 in Appendix B) were statistically significant. The negative direction of the t-statistic implied the number of days practiced weekly does not affect the potential for yoga to be a leisure coping strategy in this sample.

##### **Level of Practice**

Like days practiced weekly, LCSS-total was used to examine leisure coping with the participants level of practice. The level of practice was analyzed by two groupings: novice ( $N=22$ ,  $M=1.73$ ,  $SD=.55$ ) and advanced ( $N=39$ ,  $M=2.23$ ,  $SD=.74$ ) (Table 5 in Appendix B).

Using an independent samples t-test, the level of practice (independent variable) did not yield any statistical evidence to indicate the association between the LCSS-total (dependent variable) or the leisure palliative coping scale (dependent variable). However, one item resulted in a statistically significant outcome: “I engage in a leisure activity to temporarily get away from the problem” (N=61, M=1.98, SD=.68). Levene’s test for equality of variances can be assumed (F=1.96, p=.17). Due to the equality of variances, the t-test results  $t(59) = -2.78, p=.01, d=.68$  (Table 6 in Appendix B) indicated statistical significance. Therefore, the level of a participants practice does not affect the ability to use yoga as a leisure coping strategy during the Covid-19 pandemic

### **Years of Practice**

Years of practice were distinguished by two different categories: individuals who have been practicing one year or less (N=26, M=1.67, SD=.06) and who have been practicing more than a year (N=35, M=1.95, SD=.06) (Table 5).

An independent samples t-test was conducted based on the LCSS-total (dependent variable) and years of practice (independent variable). Levene’s test does verify equality of variances in this test (F=.75, p=.39). The t-test also yielding statistically significant results  $t(59) = -3.31, p=.002, d=.32$  (Table 6 in Appendix B). Due to the negative t-statistic, the longer a yogi has been practicing does not have any effect on the yogi’s ability to use yoga as a coping strategy.

## Chapter 5: Discussion

Most participants in the current study identified yoga as an escape from perceived increased stress levels during the Covid-19 pandemic. The current study shows the more a participant is engaged in a yoga practice, the less perceived stress the participants identified during the Covid-19 pandemic.

### **RQ1: What are the perceived stress levels of yogis?**

The importance of incorporating both physical and mental constructs into a practice to get the full benefit of yoga as an entire entity is significant (Milligan, 2006). The physical postures allow the generation of energy and heat, the meditation allows the individual to release that built up energy and emotion into the world (Kaminoff, 2007). Due to the history of *asana* originating solely from breathing techniques and meditation, the breathing aspects were what distinctly separates yoga from all other physical activities (Kaminoff, 2007).

While most participants in this study identified as having a physical practice, the final resting pose *svasana* (corpse pose), at the end of a practice can give the individual that necessary time of mental recovery. This time allows an individual to process certain emotions from unexpected events, anger, irritation, or everyday activities.

### **Perceived Stress Levels**

Through the stay-at-home orders issued across the country, many people needed to find ways to keep busy at home to protect the participants' mental, physical, and emotional well-being (Sharma, et al., 2020). Participants in this study were able to use yoga for this purpose as evident by the results of the survey.

Most participants identified having to cope with stress and other mood related symptoms from the Covid-19 pandemic. Stress has been a concern among most participants during the

earlier and mid months of the pandemic (Hossain, 2020). Thus, yoga has become and continued to be an outlet for participants who have not been able to control stressors (Riley et al., 2016), as well as participants who have heightened stress while sheltering at home. The results indicated that most participants used yoga as a palliative coping technique throughout the Covid-19 pandemic. Yoga can be a more effective exercise for palliative coping because the practice gives the individual a release of the stressors, as well as, a brief, or extended, period of processing the emotions in the meditation.

This study provides evidence to support existing empirical data regarding yoga as a strong mechanism for the alleviation of perceived stress (Riley, et al., 2016, Parshad, 2004). While there are few studies comparing the use of yoga for stress during the Covid-19 pandemic, the results aligned with similar studies executed without a pandemic (Sharma, et al., 2020). The findings displayed that even individuals who practice yoga consistently throughout the weeks and years even prior to the pandemic still experience stress. However, most individuals in the current study experienced a moderate level of stress. Very few individuals perceived a high stress environment during the Covid-19 pandemic as evident by the smaller high stress categories according to the PSS-10.

The participants in the current study paralleled the practicing yoga population in the United States, predominately Caucasian females. Due to the homogeneity, Caucasian females portrayed the widest range of stress and stress symptoms over the course of the Covid-19 pandemic regarding yoga.

Additionally, the Covid-19 pandemic has resulted in many hybrid styles for learning and activities (Jasti, et al., 2020). Live virtual classes, pre-recorded virtual classes, one-on-one



sessions, and outdoor yoga began to thrive. However, the range in relieving stress through different modalities was insignificant.

Similarly, having a strong sense of community in any setting throughout the Covid-19 pandemic became extremely important for the well-being of individual's mental health. Participants who perceived a stronger sense of community through yoga reported less stress than participants who believed the sense of the yoga community changed during the Covid-19 pandemic. The data indicate the greater sense of community an individual perceived during the Covid-19 pandemic, the greater the relationship the participants had with allowing the release of stressors efficiently. Therefore, it can be suggested that the impact of yoga on stress during the Covid-19 pandemic has been reduced in the participants due to a consistent yoga practice and support from the yoga community.

#### **RQ2: Are there differences in perceived stress levels of yogis?**

The findings displayed the amount of time practicing yoga is beneficial for handling stress and stress symptoms during the Covid-19 pandemic. Participants who practiced yoga four or more days per week showed a significantly lower amount of stress and stress symptoms during the Covid-19 pandemic. Participants who practiced three or fewer days per week still averaged a moderate amount of stress, however more participants were included in the high stress category. Most participants were dealing with stress and other mood related symptoms from the Covid-19 pandemic. Thus, yoga has become and continued to be an outlet for participants who have not been able to control stress, as well as participants who have heightened stress while sheltering at home.

The level of practice one achieves is based on the internal drive for *Samadhi* (pure bliss, enlightenment). For the purposes of the current study, participants were classified by novice or

advanced. Based on the results, advanced students have the internal drive to roll out a mat and use yoga as leisure to be confident in the ability to take control of personal stressors while staying on top of the outcomes more so than novice yogis. Advanced participants were found to display a significantly lower level of stress during the Covid-19 pandemic. The results suggested both categories of yogis have high levels of stress, however, novice yogis did not show any participants with low levels of stress. Therefore, concluding that advanced yogis have more effective tools for coping with stress than novice yogis do.

Participants who presented a more consistent daily practice over the course of one to several years revealed drastically lower levels of stress than participants who began practicing just prior to or over the course of the Covid-19 pandemic. At a certain point on an individual's yoga journey, the transfer of knowledge spirituality is used off the yoga mat. Whether that be handling personal difficulties, suffering through everyday necessities, or overcoming adversities. The range of participant's attitudes indicate the magnitude and difference in perceived stress levels that one notices at the beginning and well into the yoga journey.

### **RQ3: Is yoga a beneficial leisure coping strategy?**

Most participants identified yoga as a coping strategy for stress during the Covid-19 pandemic. However, due to the low reliability of the subscales the current study could not properly analyze the leisure companionship and leisure mood enhancement subscale to determine the benefits of yoga.

### **Leisure Coping Strategy**

The LCSS data suggest that using yoga as leisure provides means to reduce stress and promotes health to the body and mood enhancement to the mind to cope (Iwasaki & Mannell, 2000) with the fast-changing events of the pandemic. Previous data suggests yoga is a beneficial

coping strategy for dealing with stress and stress related symptoms (Cheng, et al., 2018, Richardson, 2019). The research was studied throughout many different populations, such as individuals with disabilities (Richardson, 2019), flight attendants (Cheng, et al., 2018), adolescents (Frank, et al., 2014), along with numerous others. Most studies found yoga as an effective coping strategy regarding leisure companionship, leisure palliative coping, and leisure mood enhancement. However, due to researcher modified scale in the study, the LCSS supported this data as a whole and with leisure palliative coping.

The spirit of the yoga community prevailed throughout the pandemic, as evident by the broad spectrum of access to classes through a multitude of modalities. The pandemic encouraged individuals to challenge spiritual beliefs inside and outside of yoga to make connections with individuals to prove that physical distance has little power on the strength of unity in the yoga community. However, the leisure palliative coping subscale resulted with no correlation in the sense of community.

#### **RQ4: Are there differences in leisure coping strategies of yogis?**

While the current survey yielded low reliability for two of the three subscales due to the modification, the results displayed similar findings to other articles using a similar modified version (Jordan, 2014). Practicing yoga consistently allowed participants to control the breath and ease the mind (Kupersmidt & Barnable, 2019). A participant's level of practice indicates the perception of a yogi's physical and spiritual practice. Therefore, the stronger a yogi's practice was, the more confident the participant was in maintaining composure, strength, and happiness throughout unprecedented times. The days practiced weekly, the individual's level of practice, and the years of practice did not affect the ability to use yoga as leisure coping strategies for means of stress reduction during the Covid-19 pandemic.

## Recreational Therapy and Yoga

The study shows yoga could be a beneficial modality for recreational therapy patients displaying symptoms of stress due to the desire for the individual to improve every aspect of the body. As with many therapies the use of yoga in recreational therapy could be suggested by a medical doctor, therefore, giving more incentive for a patient to attend treatment. With the growing research of yoga and recreational therapy, many benefits have been found for a significant number of different populations outside of stress. For example, many chronic conditions including stroke (Van Puymbroeck et al., 2014), chronic pancreatitis (Sareena, et al., 2007), geriatrics; helping with balance (Adams et al., 2019), Parkinson's (Hawkins et al., 2018), along with so many others.

However, the importance of a recreational therapist fully grasping the intricacies of the practices of yoga before providing therapeutic aid to a patient will determine the extent of yoga's benefits. The necessity for the therapist to properly gauge the patient or population to provide the best physical sequence and meditational practice is of most importance for the patient. For example, patients with cardiac or respiratory conditions should not practice certain types of breathing techniques, because of the risks of becoming in physical distress (Kaminoff, 2007). Other patients with anxiety, PTSD, etc. should be warned that certain poses and meditative aspects can produce an immense amount of emotional response, both positive and negative (Kaminoff, 2007). Therefore, allowing the patient to prepare for this type of practice prior to the session is essential for healing.

The data revealed the benefits of yoga as a stress relieving mechanism for participants of all levels and backgrounds. From the current study, it can be inferred that yoga could be a beneficial treatment modality within recreational therapy. However, more studies are needed

within the recreational therapy setting using yoga to relieve stress to fully correlate the benefits of using yoga as a treatment modality for recreational therapy.

### **Limitations and Future Research**

A limitation in the current study is the lack of diversity. However, the sample population of the study is representative of yogis in the United States, predominately Caucasian females. Future studies should attempt to diversify the sample in gender, race, and include age to gain potentially different viewpoints than the average population in the U.S. of Caucasian females. Additionally, the self-reporting of level of practice could skew data by one novice yogi believing they are advanced or one advanced yogi believing they are more novice. Finally, not knowing how many people received the survey invitation due to social media and snowball sampling was a final limitation. Finally, the self-reporting of level of practice

## Chapter 6: Conclusion and Recommendations

The findings from the current study suggest yoga is beneficial at reducing perceived stress levels during the Covid-19 pandemic. Participants who practiced more than four days per week, were advanced in their learning, and had more than one year of practice showed the lowest levels of perceived stress. Additionally, yoga has been supported by research to be a beneficial coping mechanism for stress reduction in participants during the Covid-19 pandemic.

Due to yoga's ability to reduce perceived stress levels and be used as a coping strategy, yoga has been suggested to be a tool for recreational therapy to relieve physical and mental aspects of injury. As the Leisure Coping Framework (LCS) suggests, purposeful leisure reduces the effects of stress. The current study is one of the first to explore the effects of yoga for coping with stress and the benefits on mental health during the Covid-19 pandemic.

The current study was designed to examine the perceived stress levels of yogis and stress related symptoms, as well as, using yoga as a leisure coping strategy for stress reduction during the Covid-19 pandemic. Due to the pandemic's lack of ability to interrupt the mental and spiritual teachings of yoga, the ability to relieve stress in participants was continuous throughout.

A novel result of this study was that yoga can be assumed to be a positive modality for yogis at reducing perceived stress during the Covid-19 pandemic.

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## Appendix A- Survey and Scales

1. How many days a week have you practiced yoga during the Covid-19 pandemic?
  - a. 0
  - b. 1-2
  - c. 3-4
  - d. 5+
2. What gender do you identify as?
  - a. Male
  - b. Female
  - c. Other
3. What race do you identify as?
  - a. African American
  - b. American Indian
  - c. Pacific Islander or Native Hawaiian
  - d. Caucasian
  - e. Other \_\_\_\_\_
4. Were you furloughed or did you lose your job due to Covid-19?
  - a. Yes
  - b. No
5. How many days a week do you typically practice yoga?
  - a. 1-2
  - b. 3-4
  - c. 5+
6. How long have you been consistently practicing yoga (2+ times a week)?
  - a. Less than 6 months
  - b. 6 months to 1 year
  - c. 1-2 years
  - d. 2-4 years
  - e. 5+ years
7. Do you consider yourself...?
  - a. Yoga teacher
  - b. Yoga student
  - c. Both
8. How has your commitment to your yoga practiced changed throughout the Covid-19 pandemic (amount of time in practice, days a week, etc)?
  - a. It increased
  - b. It decreased
  - c. It stayed the same
9. On a scale of 1-7  
how many days are you committed to your yoga practice?  
Not committed 1 2 3 4 5 6 7 strongly committed
10. Do you consider yoga a coping strategy for stress and stress symptoms?
  - a. Yes
  - b. No
  - c. N/A

11. Do you consider yoga your leisure activity?
  - a. Yes
  - b. No
  - c. N/A
12. During the pandemic, do you practice... (check all that apply)
  - a. Virtually
  - b. Outdoors
  - c. In studio
  - d. One on one
  - e. Other
13. Has the sense of your yoga community changed since the start of the pandemic?
  - a. Yes
  - b. No
14. On a scale of 1 to 7  
 To what degree do you feel the yogi sense of community during the pandemic?  
 No sense    1    2    3    4    5    6    7    Strong sense
15. What do you consider the level of your yoga practice?
  - a. Beginner
  - b. Novice
  - c. Intermediate
  - d. Advanced

**Perceived Stress Scale (PSS) (Stress)** (the questions in this scale ask you about your feelings and thoughts during the course of the pandemic. In each case, you will be asked to indicate by circling how often you felt or thought a certain way.)

0= never, 1=almost never, 2=sometimes, 3= fairly often, 4=very often

16. How often have you been upset because of something that happened unexpectedly?  
 0    1    2    3    4
17. How often have you felt that you were unable to control the important things in your life?  
 0    1    2    3    4
18. How often have you felt nervous and “stressed”?  
 0    1    2    3    4
19. How often have you felt confident about your ability to handle your personal problems?  
 0    1    2    3    4
20. How often have you felt that things were going your way?  
 0    1    2    3    4
21. How often have you found that you could not cope with all the things that you had to do?  
 0    1    2    3    4
22. How often have you been able to control irritations in your life?  
 0    1    2    3    4
23. How often have you felt that you were on top of things?  
 0    1    2    3    4
24. How often have you been angered because of things that were outside of your control?  
 0    1    2    3    4

25. How often have you felt difficulties were piling up so high that you could not overcome them?

0      1      2      3      4

### **Leisure Coping and Stress Scale**

The following questions are meant to gauge the extent to which you use yoga as leisure in order to cope with stressors. Leisure time is the “free time” not committed to work or other obligations.

Please select the answer that best describes you.

Very much like me (1) Somewhat like me (2) Rarely like me (3) Not at all like me (4)

26. I deal with stress through spending leisure time with my friends.

1      2      3      4

27. My leisure allows me to be in the company of supportive friends.

1      2      3      4

28. Engaging in social leisure is a stress-coping strategy for me.

1      2      3      4

29. Lack of companionship in leisure prevents me from coping with stress.

1      2      3      4

30. I engage in a leisure activity to temporarily get away from the problem.

1      2      3      4

31. Escape through leisure is a way of coping with stress.

1      2      3      4

32. Leisure is an important means of keeping myself busy.

1      2      3      4

33. Engagement in leisure allows me to gain a fresh perspective on my problems(s).

1      2      3      4

34. By escaping from the problem through leisure, I am able to tackle my problem(s) with renewed energy.

1      2      3      4

35. I gain positive feelings from leisure.

1      2      3      4

36. I maintain a good mood in leisure

1      2      3      4

37. My leisure involvements fail to improve my mood.

1      2      3      4

38. Leisure helps me manage my negative feelings.

1      2      3      4

## Appendix B- Tables

**Table 1**

*Demographics*

	N	%
Gender		
Female	61	91.0
Male	6	9.0
Race		
African American	4	6.0
Caucasian	53	79.1
Pacific Islander	2	3.0
Hispanic/Middle Eastern	8	11.9
Days Practiced Weekly		
3 or less	32	47.8
4 or more	38	56.7
Years of Practice		
1 year or less	30	44.8
Over 1 year	40	59.7
<b>Total</b>	<b>67</b>	

**Table 2**

*Yogi Stress Level Total*

	N	%
Perceived Stress Scale		
Low	12	17.9
Moderate	52	77.6
High	3	4.5
Total	67	100

**Table 3**

*Means and Standard Deviation for PSS-10*

	N	M	SD
Days Practiced Weekly			
3 or less days	31	19.32	5.11
4 or more days	36	16.69	4.06
Level of Practice			
Novice	25	20.92	3.71
Advanced	42	16.12	4.38
Years of Practice			
1 year or less	29	19.24	4.21
More than 1 year	38	16.89	4.9

**Table 4***T-test Statistic for PSS-10*

	t	df	p	d
Days Practiced Weekly	2.3	57.02	0.03*	4.58
Level of Practice	4.59	65	<.001*	4.14
Years of Practice	2.1	64	0.04*	4.62

\*significant .05 (2-tailed)

**Table 5***Means and Standard Deviation for LCSS*

	N	M	SD
Days Practiced Weekly			
3 or less days	26	1.78	0.07
4 or more days	35	1.87	0.05
Level of Practice			
Novice	22	1.73	0.55
Advanced	39	2.23	0.74
Years of Practice			
1 year or less	26	1.67	0.06
More than 1 year	35	1.95	0.06

**Table 6***T-test Statistic for LCSS*

	t	df	p	d
Days Practiced Weekly				
“Temporarily get away”	-2.35	59	0.02*	0.69
Level of Practice				
“Temporarily get away”	-2.78	59	0.01*	0.68
Years of Practice	-3.31	59	0.002*	0.32

\*significant .05 (2-tailed)

## VITA

Ellie Madenberg was born in Evanston, Illinois to the parents of Gerri and Andrew Madenberg. She grew up in Deerfield, Illinois. Ellie Graduated from Deerfield High School in 2014 and began her undergraduate studies at the University of South Florida in August 2014. She Graduated with a Bachelor of Science degree in Biological Health Sciences in May 2018. Then, Ellie furthered her education pursuing a master's degree in Recreation and Sport Management with a concentration in Recreational Therapy at the University of Tennessee in 2019.