Yoga, Stress, and College Students During the COVID-19 Pandemic: A Mixed Methods Study

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Yoga, Stress, and College Students During the COVID-19 Pandemic: A Mixed Methods Study

A Dissertation

Presented to the Faculty of the

College of Education and Social Work

West Chester University
West Chester, Pennsylvania

In Partial Fulfillment of the Requirements for the

Degree of

Doctor of Education

By

Lori Klein

May 2022

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Dedication

I have dedicated this dissertation to my yoga *sangha* (community) of students, fellow teachers, and to my dear friend and fearless leader, Beryl Bender Birch. I would also specifically mention my yoga colleague, Anne Falvo, who has been by my side during my yoga journey and to share in the hills and valleys of life. Of course, this dissertation would not be possible without the decades of work that Alison Donley invested in teaching yoga within higher education.

Thank you all for developing my understanding of yoga as a 24/7 daily practice.
Acknowledgements

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I thank my husband, Michael, and our sons- Matthew and Logan, for always being there for me with love and grounding me back into daily living. I thank my pandemic pups, Lulu and Zoey, who filled my days with smiles during this lengthy process. They were my writing retreat buddies who patiently waited while I typed for hours, and then pulled me outside for a hiking break. Thank you to Anne Falvo for always reading my work and offering great feedback. Thank you to friends, Renee and Jimmy Lennon and Kelly Melle, who offered up their quiet spaces for my writing retreats. Thank you to all my friends and family who checked in on me and listened to me think aloud. I wish I could list all your names because I will never forget each of your contributions. Finally, my grateful heart extends deep thanks to my yoga colleagues and students around the world. You have inspired this research and supported it every step of the way.
Abstract

College students have experienced exponential increases in stress and mental health concerns that continued to rise during the global coronavirus pandemic. Yoga is a popular, well-regarded method for improving psychological wellbeing, and this study explored how students’ perceived stress improved during a semester-long introductory yoga course upon returning to in-person instruction after a period of remote learning as a result of coronavirus restrictions. This study used an explanatory sequential mixed method design to first measure perceived stress scores and then compare this data to student-reports of wellbeing. College students (n = 121) enrolled in 8 sections of Yoga 1 completed the Perceived Stress Scale (PSS) during weeks 3, 7, and 11, and reported statistically significant decreases in stress between weeks 3 and 11 according to repeated measures ANOVA analysis with a significant effect for time, Wilks’ Lambda = .92, F (2, 119) = 5.02, p < .01. A stratified random sample (n = 27) of student cases were selected for qualitative analysis of reflective assignments in Dedoose using a constant comparative method. The main themes of students’ experiences were finding a sense of ease, supercharging, holding opposing forces, and preparing to tackle the day. Results from data convergence indicated that the yoga classes supported psychological wellness among college students, while divergent findings demonstrated that self-report surveys may not accurately measure the interaction of stress and coping skills. Future research is recommended to expand approaches that improve college students’ wellbeing.

Keywords: Yoga, undergraduate college students, stress, psychological wellbeing, mixed methods
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Chapter I: Introduction

While most people appreciate the conveniences of modern technology and increasing globalization, they also feel the increasing burden of keeping up with the accompanying increased pace of daily life. Many people take for granted how these stressors accumulate and assume that constant availability is just part of life in today’s world. People around the world are experiencing added new burdens of social isolation, economic decline, and fear of illness that have increased stress levels during the coronavirus (COVID-19) pandemic (American Psychological Association [APA], 2020). Additionally, people have been forced to confront the systemic racism as violence towards persons of color was videotaped and at the forefront of the news (Van Bavel et al., 2020). When someone is under consistently high stress, this can lead to anxiety, depression, and mental illness as well as physical health problems (APA, 2020). While stress is common for all humans, some populations experience higher levels of chronic stress or suffer from post-traumatic stress (APA, 2020). As one of these identified groups, college students today are overly busy and stressed with rising prevalence of anxiety and depression; and college campuses are struggling to meet mental health needs (Deckro et al., 2002; Falsafi, 2016; Gaskins et al., 2014; Villate, 2015). Administrators and faculty also need to consider the specific groups (e.g. marginalized and under-represented students) at higher risk within this population when developing stress reduction programs and services (APA, 2020; Boden et al., 2021; Galea et al., 2020; Reger et al., 2020).

College students encounter specific stressors during young adulthood, “the age of instability”, that negatively impact mental health and overall wellbeing (Mahfouz et al., 2018, p. 3). This age group has suffered exponential increases in mental illness and suicide rates that are predicted to rise even more throughout the COVID-19 pandemic (Galea et al., 2020; Reger et al.,
College students would likely benefit from increased skills in stress management and self-regulation for optimal cognitive and emotional functioning, and contemplative practices such as yoga can teach these critical skills (Bamber & Schneider, 2016, 2020). Although parents and college administrators may not value yoga, meditation, and mindfulness as direct contributors to future careers, students learn skills through contemplative practice that can benefit all areas of living and learning.

Researchers have used a variety of definitions for yoga and have struggled to operationalize yoga and contemplative practice. For this study, I used the comprehensive definition of the eight-limbed path of classical yoga, because the introductory yoga curriculum includes all elements of yoga and is not solely a physical posture practice. The eight-limbed path of classical yoga includes moral and ethical precepts, physical postures, breathing techniques, and meditation (Hartranft, 2003). Some researchers have focused on meditation, mindfulness, Mindfulness Based Stress Reduction (MBSR), and various Mindfulness-based Interventions (MBIs) and these interventions fit within this broad definition of yoga (Bamber & Schneider, 2016, 2020; Beck et al., 2017). In this chapter, I will share an overview of this study which explored how college students manage stress and discover changes in wellness during a comprehensive semester-long yoga course.

**Rationale and Significance**

In the past year, people around the world have faced significant trauma both individually and collectively as they navigated a global pandemic and awakened to racial inequity and injustice (Van Bavel et al., 2020). This state of constant hypervigilance often has an additive effect on the existing trauma, stress, and anxiety that were already common topics within the educational system (Van Bavel et al., 2020). Thus, students cannot learn when their nervous
systems are in hypo-arousal or hyper-arousal, as toxic stress contributes to nervous system
dysfunction with detrimental impacts to cognitive function (McEwen & Morrison, 2013;
NCSEA, 2019; Van der Kolk, 2015; van Aalst et al., 2020). University students, especially those
in their first year, will continue to cycle through times of uncertainty related to living in group
environments while coronavirus fears continue (American College Health Association [ACHA],
2021). Additionally, first-year students already leave familiar support systems behind when they
move to a university campus, and now they are transitioning to group living and learning
environments with varying levels of social distancing, vaccination, and masking (ACHA, 2021;
Mahfouz et al., 2018).

   College students were already struggling with tremendous stress and anxiety of the
expectations of adulthood, and current events of a global pandemic and racial injustice have
added new concerns (Van Bavel et al., 2020). These changes in our current world situation are
likely to magnify existing mental health concerns and educational systems need solutions that are
cost-effective and able to reach a wide population. Although COVID-19 pandemic related issues
of school closures and remote learning negatively impacted many students across all levels of
education, college students faced additional challenges that added to existing high rates of mental
health concerns (Mahfouz et al., 2018; Zhai & Du, 2020). Specifically, many students dealt with
interruptions to academics, transitions back to parental homes or homelessness, job losses or
difficulty finding post-graduation employment, and fears of spreading illness to aging family
members (Zhai & Du, 2020). These acute problems accumulated on top of pre-existing stress and
anxiety during the already rocky transition to young adulthood (Zhai & Du, 2020).

Researchers who study the neurobiology of trauma have provided evidence that
meditation, mindfulness, embodied practices like yoga, and self-regulation strategies can all calm
the nervous system into a state conducive to learning (Leitch, 2017; Loizzo, 2018; Taylor et al., 2020; van Aalst et al., 2020; Van der Kolk, 2015). The simple act of asking students to check in with the physical body and sensations for a few breaths can ease both mind and body. Thus, yoga and mindfulness credit-based courses are increasingly popular on college campuses and may reach a wider group of students than traditional counseling services (Conley et al., 2015; Neumark-Sztainer et al., 2020). Expanding these offerings may be an effective front-line strategy for supporting students with existing mental health concerns and preventing crisis situations (Conley et al., 2015; Neumark-Sztainer et al., 2020).

In this study, I examined the role of a semester-long, college yoga course on students’ stress management upon returning to in-person instruction after extensive remote learning because of a global pandemic. Students reported their perceived stress levels throughout the semester as they developed a consistent yoga practice. In addition, a smaller sample of students shared the ways that they experienced changes in wellness within the yoga course and how these improvements carried over into daily life.

**Positionality**

As an adjunct faculty member at a mid-Atlantic higher education institution, I have personally witnessed the devastating effects of stress and trauma on college students. I have frequently felt awed as I watched struggling students gain coping skills during the Yoga 1 course and learn how to handle tremendous stressors and demanding situations. In my time teaching the course, I have witnessed some students develop an incredible maturity and patience from yoga practice in a noticeably short amount of time. Through the simple act of conscious breathing, students begin to calm their bodies and minds and take life one moment at a time. Students have
shared how the lessons learned in Yoga 1 permeated all areas of daily life from academics to relationships to careers.

As a long-time yoga practitioner who started contemplative work during my own young adulthood, I know firsthand the transformative power of this practice. Many students who cannot access typical mental health care find relief in their yoga practice, and others learn to use tools to prevent future illness. I have consistently heard practitioners report that yoga saved them from addiction, depression, grief, or just the chaos of daily life. I am motivated to share my practice to alleviate the suffering of others while constantly exploring what specifically it is about yoga that is so helpful. I have also experienced the disregard for yoga as a legitimate method for maintaining overall health from those who misunderstand the tradition and are hesitant to try contemplative practice. Younger adults may be more open to mind-body practices as evidenced by increased rates of yoga practice within this demographic in recent years (Zhang et al., 2021).

Pilot Study

Researchers have not had much opportunity to study college-level Yoga courses because of the scarcity of comprehensive programs (Villate, 2015). I have heard students express how they gain tremendous relief and improved wellbeing in yoga programs, and I wanted to explore how students experienced this course during remote instruction as a result of a global pandemic. I conducted a pilot study to provide support for the current research upon return to in-person instruction and gained insight into what students need to alleviate stress and promote wellness during this challenging time. For this pilot study, I focused on the two course sections that I taught during Spring 2021: 35 students were enrolled in a synchronous section, and 45 students were enrolled in an asynchronous section. I wanted to gather more information on students’ experiences in Yoga 1 and learn more about what students found to be helpful within the course.
I also used the pilot study as an opportunity to refine data collection and analysis prior to working with the larger sample in the dissertation study.

**Pilot Study Design**

In the Spring 2021 pilot study, I employed a two-phase explanatory sequential (quan→QUAL) design where I first administered a modified Perceived Stress Scale (PSS) through a Qualtrics survey at three points across the semester, and then I analyzed a smaller sample of students’ reflective assignments. I also included the option of interviewing participants from the smaller qualitative sample in the Institutional Review Board (IRB) application (Approved Protocol Number IRB-FY2021-59, Appendix A). However, I later decided that there was adequate qualitative data for the purposes of the pilot study from the reflective assignments and did not feel that I would gain additional insight through interviews. I used the preliminary quantitative PSS data to select the smaller qualitative sample based on different levels of perceived stress. Participants consented to analysis of their reflective assignments including an initial reflection, daily practice journals, and a final reflection.

**Quantitative Phase: Perceived Stress**

In semesters prior to Spring 2021, Yoga 1 students completed a different stress assessment from the textbook that is a little more invasive, but the instructors did not typically read their answers. The textbook assessment, adapted from the American Institute of Stress, contained symptoms of stress for students to rate including “increased smoking, alcohol, or drug use” and “compulsive or obsessive actions” (Donley, 2016). When the university moved to remote instruction during Spring-Fall 2020 semesters and I reviewed the assessments instead of glancing at them to check for completion, I noticed that the students’ stress assessment responses were overly personal and decided to switch to the Perceived Stress Scale (PSS) for a broader
look at students’ stress data. I opted to use the PSS because this scale has been frequently used with college students, and the questions are less invasive than the textbook stress assessment that students completed in previous semesters (Lee, 2012).

**Instrumentation.** The Perceived Stress Scale is a validated tool that asks respondents about their general stress including how frequently they have felt stress, nervousness, and anxiety across the past month (Cohen et al., 1983). The PSS contains 10 questions with responses on a 1-5 Likert scale, and a higher summed score indicates greater stress. Cohen et al. (1983) categorized the total stress scores into three levels: low (0-13), moderate (14-26), and high (27-40) perceived stress, and researchers have used both the summed scale and category scores in reporting results. In a United States national poll, a sample of 2,387 adult respondents completed the PSS and researchers calculated a mean stress score of 14.2 (SD = 6.2) for the 18–29-year-old age range (N = 645). This large sample provided baseline reference numbers for comparison with target groups, and researchers have validated the PSS with Cronbach’s alpha > .70 among college students (Lee, 2012). Participants can complete the PSS in less than ten minutes, and this increases the likelihood of completion. Researchers can administer the PSS at multiple points during an intervention to compare perceived stress levels across time, and participants completed the PSS at three time points during this pilot study.

**Data Collection.** During the third week of the Spring 2021 semester, I embedded the informed consent in the first PSS survey and 72% of students (n = 58) consented to participate in the pilot study. Students completed the survey again during week 7 and week 11. Even though each survey was an assignment, only 69% participants (n = 40) completed all three data points on perceived stress. The survey was only worth one point on a 100-point scale, and 18 participants missed one of the three data collection points for the survey.
Data Analysis and Results. I analyzed the PSS data using Statistical Package for Social Sciences (SPSS 24.0) to report descriptive statistics and trends in perceived stress. I conducted a one-way repeated measures ANOVA to compare scores on the Perceived Stress Scale at Week 2-3, Week 7, and Week 11 during the 16-week semester. There was a significant main effect on perceived stress across time in the semester-long yoga course, Wilks’ Lambda = .66, $F(2, 38) = 9.97, p < .001$, multivariate partial eta = .34. The partial eta squared of .34 indicated a very large effect size according to Cohen’s (1988) guidelines with .14 = large effect as depicted in Table 1 (pp. 284-287). Therefore, students reported a statistically significant reduction in perceived stress across the semester according to the repeated measures ANOVA. Since the ANOVA test can only analyze that there is an overall difference, I conducted Bonferroni post hoc testing to determine between which time points there was a statistically significant different in perceived stress.

Table 1

One-Way Repeated Measures Analysis of Variance Comparing Perceived Stress Across Three Time Points

<table>
<thead>
<tr>
<th>Variable</th>
<th>Week 2-3</th>
<th>Week 7</th>
<th>Week 11</th>
<th>$F(2,38)$</th>
<th>$\eta^2p$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>Perceived</td>
<td>20.78</td>
<td>6.24</td>
<td>17.90</td>
<td>6.47</td>
<td>17.38</td>
</tr>
</tbody>
</table>

*a n = 40 for each stress data point

*p<.001

Note. This table shows the changes in mean perceived stress scores across three data points
The Bonferroni post hoc testing identified that participants' perceived stress decreased significantly between weeks 2 and 7 (p = .000) as well as between weeks 2 and 11 (p = .002). While participants reported lower perceived stress at the week 11 data point (M = 17.38) than during week 7 (M = 17.90), this difference was not statistically significant (p = .510). However, the overall decrease was significant across time in the course for the overall group. The quantitative data provided a broad overview of changes in stress level among participants who completed all three data points.

The significant decreases in perceived stress across the semester-long yoga course may indicate that students learned to manage stress reactions through contemplative practice, but this quantitative data was limited to numerical changes across a group of students with different life circumstances and individual intentions within the course. While I could have analyzed additional PSS data, I chose to focus on the overall trends in perceived stress and to select the random stratified sample for the qualitative phase for the pilot study. In the second qualitative phase, participants provided actual testimony on how important yoga practice was in their daily lives during an incredibly challenging time of remote learning, political turmoil, and a global pandemic.

**Qualitative Phase: Students’ Lived Experiences**

While the quantitative data provided important information on how perceived stress decreased during the semester-long yoga course, I also wanted to capture more in-depth information on student experiences. I randomly selected two students from each of the three stress levels (high, moderate, low) on the first data point at Week 2 for the qualitative sample (n = 6). I reviewed the participants initial reflections, journals, and final assessments to develop preliminary codes, and then entered all documents into Dedoose for further coding and analysis.
Participants described benefits of practicing yoga across three main thematic areas of stress management, physical health, and mind/body connection. While participants often mentioned areas of physical health and stress management separately, they frequently referenced the interconnected nature of mind and body in reflective assignments. I identified sub-themes within each of the overarching areas and noted commonalities and differences in themes based on high, moderate, and low stress.

**Stress Management.** Participants consistently described the ways that yoga practice helped them manage stress and anxiety. The two students with high perceived stress at the first data point also discussed aspects of mental health frequently in their reflective assignments. When an individual lacks coping strategies and support systems, they cannot handle the excessive stress in daily life and may develop greater mental health concerns (Antonovsky, 1979; Brinsley et al., 2020). Thus, mental health was a sub-theme of stress management. I categorized other sub-themes based on the ways that participants discussed how yoga practice helped them control and reduce stress.

Participants often noted in their daily practice journals that they felt overwhelmed before practice but were able to "clear the mind" during practice to create feelings of peace and relaxation. They subsequently approached their stressors as more manageable and were able to approach the rest of the day with a more positive outlook. Participants not only appreciated the respite that yoga provided during class, they also reflected on the ways that they utilized yoga as a coping strategy in daily life. Those with the highest initial stress wrote in more detail about the tremendous impact of yoga and mindfulness on their deeper mental health specifically through self-compassion and self-care to combat a history of anxiety and depression. All participants also shared the ways that yoga supported their physical health.
Physical Health. Participants shared how yoga practice improved many aspects of physical wellbeing, but most commonly referred to an overall sense of feeling good in their bodies after practice. They attributed this positive feeling to gaining flexibility through stretching and exercise. Most participants also improved strength as documented by increasing the number of pushups that they were able to complete by the end of the semester. They also experienced improved sleep and felt that they made healthier choices overall. Participants discussed having more energy and I could have considered this theme a part of physical health, but I categorized energy within the mind-body connection theme because students referenced their overall energy to "get through the day" that was more holistic.

Mind-Body Connection. Participants found that yoga improved physical health and helped manage stress, but also developed critical awareness of the mind-body connection. I coded sub-themes related to holistic wellbeing, breathing, listening to the body, and cultivating mindfulness. The sub-theme of mindfulness further expanded into paying attention, experiencing sensory input, being in the present moment, and cultivating gratitude.

Yoga and contemplative practice operate on multiple levels simultaneously, and researchers are challenged to operationalize the outcomes because of this complexity (Brinsley at al., 2020; Lutz et al., 2015). Practitioner statements offered the most powerful insights into the experience of yoga that best described their changes in wellness. One participant captured how the yoga course supported these themes in a statement on their final assessment:

For so long, I trained my mind into thinking that I did not deserve a break or any proper outlets for coping with stress and daily life. However, it was this class that completely opened my eyes to the beneficial ways that taking care of the way that we eat, the way
that we exercise our bodies, and the way that we talk to ourselves can have on our lives.

(Participant 25)

This student started the semester with high perceived stress that lessened to moderate perceived stress across the semester. All six participants in the qualitative sample noted in their final reflections that while their symptoms of stress did not completely disappear, they were able to better manage their reactions in challenging situations and respond more calmly than before.

Another participant described how she used yoga breathing outside of class:

One day, I was having a very stressful day at work. A child was having multiple tantrums and throwing furniture putting other students in danger which was very scary. I was able to have someone relieve me from the room for a few minutes to catch a break. In this time, I decided focusing on my breathing would be the best thing for me. It helped me to calm down and to figure out a plan with my staff to deal with the situation at hand.

(Participant 28)

This student was able to apply yoga as a coping tool in daily life and defuse a potentially violent situation. While people commonly advise taking “10 deep breaths” to calm down when someone is angry, they often lack the ability to consciously breathe in a way that downregulates the nervous system unless they have training. Yoga practitioners first learn to use the breath in this way in a calm and controlled environment, and then can effectively calm down when in heightened state.

Pilot Study Summary

This pilot study and my observations as a teacher-researcher informed my hypothesis that Yoga 1 can help students adapt as they return to a “new normal” post-pandemic for the larger dissertation study. I gained insights during the pilot study that improved the rigor and methods as
with the increased number of participants (N = 121) enrolled in eight sections of Yoga 1 across three instructors. The pilot study provided the opportunity to better organize data collection at all stages, select a more diverse qualitative sample, analyze perceived stress scores thoroughly, address attrition, and identify more appropriate qualitative methods.

**Data Collection.** I learned during the pilot study that I would need a solid method for collecting data across eight course sections that allowed instructors to grade assignments for credit and provided me with access to both the larger quantitative sample and the smaller qualitative reflective assignments. For the quantitative survey, I used Qualtrics in both the pilot and the dissertation study. I met with all instructors in August 2021 to thoroughly discuss using the modified PSS survey with a QR code, and they decided that students who attended class on that day would receive credit for completion. For the qualitative assignments, I set up the course in a development shell in the Brightspace Learning Management System, and all instructors agreed to use the same course set up and granted me access to their course for review of participant assignments.

I collected extensive qualitative data in the pilot study and did not code these reflective assignments until after the semester. I wanted to separate myself from the researcher role in case my dual teacher/researcher position biased how I viewed the data. I realized that this would not be feasible in the larger study, and that I would need to organize the assignments throughout the semester for the dissertation study. I removed student identifying information from reflective work to reduce bias in the larger sample but organized and analyzed data more continuously than in the pilot study to better manage data collection.

**Qualitative Sample Selection.** During the pilot study, I also identified a strategy for selecting the qualitative sample. I decided to select students from high, moderate, and low
perceived stress levels at the initial survey data point, and this allowed me to follow participants across the semester and observe trends in themes based on initial perceived stress. Since the initial qualitative sample was small (n = 6), I was not able to draw definitive conclusions on these trends, but these informed my thought process for the larger study. Additionally, I selected a more diverse pool of participants by using this random stratified sample.

**Perceived Stress Analysis.** While I only included a brief analysis of perceived stress data in the pilot study, I carefully considered additional analysis for the dissertation study. I understood the need for analysis of differences in starting and ending stress across individual based on demographic characteristics. I was prepared to better identify what might have been different about students who did not complete all PSS data points.

Additionally, since perceived stress scores follow the normal distribution with the majority of individuals reporting a moderate level of perceived stress, I further divided the moderate stress group (PSS scores of 14-26) into high-moderate (21-26) and low-moderate (14-20) groups. When I split the moderate group into two categories, I was better able to analyze the trends in individual PSS scores changes according to stress level across the semester.

**Attrition Prevention.** There was a high consent rate in the initial PSS for the pilot study, but also a high attrition rate (31%). I did not realize initially how many participants were lost when a few did not complete the second survey and then a few different students did not respond for the third survey. I prepared for this with the larger sample and offered a gift card raffle incentive for the dissertation study and ensured that students would complete the PSS during class time. However, this incentive did not prevent the loss of participants on the follow up surveys.
Qualitative Methods. I refined the qualitative methods for the case study by eliminating the interviews for the dissertation research. I did not identify any benefit for interviews during the pilot study and did not have enough time for interviews after analyzing data since I held off until the end of the semester. For the dissertation study, I decided to incorporate focus groups for participants in each stress level of the qualitative sample to better develop the cases. However, I was not able to gather enough students who were willing to participate in the focus groups and did not glean any new insights during the only focus group that I held with two students. I realized that students provided ample data in their reflective assignments and were likely to be more open in their writing than in interviews or focus groups.

The pilot study provided important information on students’ stress and wellbeing during remote learning, and I strengthened the larger study by testing my proposed methods in advance. While the problem statement and rationale were very similar, the dissertation study used a larger sample in a slightly different context across several faculty members using the same curriculum.

Problem Statement

College students are confronting an unmitigated increase in stress, anxiety, and serious mental health issues without a foreseeable solution (ACHA, 2019). College students’ self-reported mental health attributes across the past twelve months indicated that almost 60% felt hopeless, over 66% felt overwhelming anxiety, and over 46% experienced depression, illustrating a steady increase from previous years (ACHA, 2019). According to the Centers for Disease Control (CDC, 2017), suicide is the second leading cause of death in the age groups encompassing traditional college students. The Centers for Disease Control (Vahration, 2021) shared preliminary survey data that 1 in 4 young adults in the United States (ages 18-29) contemplated suicide during the initial stages of the pandemic between March and June 2020.
These statistics are expected to become even more grim in the coming years because of changes in daily life as a result of the COVID-19 pandemic (Galea et al., 2020; Reger et al., 2020).

The ACHA (2021) offered guidelines for returning to campus in Fall 2021 and noted that the situation has become even more challenging despite widespread vaccination and the return to somewhat normal routines. The recommendations included an array of campus-wide support through the health center, counseling, and trauma-informed practices (ACHA, 2021). However, many resources were overly burdened prior to the pandemic, and may not be available as even greater numbers of students need support services (ACHA, 2021). The ACHA report (2021) suggested mindfulness and self-care supports for faculty but missed the opportunity to recommend contemplative programming for students. College campuses are in dire need of cost-effective practices for emotional wellbeing that can reach many students simultaneously (Bamber & Morpeth, 2019; Bamber & Schneider, 2016; Conley et al., 2015; Regehr et al., 2013).

Researchers have suggested that trauma-informed yoga classes may be a popular option for primary prevention of stress-related illness (Boden et al., 2021; Conley et al., 2015). When undergraduate students can access yoga classes as part of their regular course schedule, many common barriers of money, time and access to yoga are removed (Neumark-Sztainer et al., 2020). Thus, yoga and contemplative practice may provide an appealing method of support for a wide range of students, and I explored the following research questions to develop a better understanding of how yoga and contemplative practice can better support this population.

**Research Questions**

The overarching question for this study was *What is the experience of college students in relation to wellbeing while enrolled in a semester-long yoga course?* This broad question was addressed through several sub-questions:
1. To what extent does perceived stress among college students change during a semester-long yoga course? (Quantitative)

2. In what ways do students experience changes in wellness throughout a semester long yoga course? (Qualitative)

3. How do college students describe aspects of the Yoga course that support their wellbeing? (Qualitative)

4. To what extent do the quantitative results on perceived stress agree/disagree with the student reflections on the benefits of yoga for psychological wellness? (Mixed methods)

**Rationale for Mixed Methods Research**

While the statistics on mental health needs of college students are clear, empirical data on contemplative practice interventions is notably clouded by lack of rigor, small sample sizes, and inconsistent results (Bamber & Schneider, 2016; Breedvelt et al., 2019; van Aalst, 2020). Additionally, the existing research has mostly relied on quantitative self-report survey measures of psychological wellness such as perceived stress, mindfulness, and self-compassion in pretest/posttest evaluation of interventions (Bamber & Schneider, 2016; Beck et al., 2017; Lutz et al., 2015; van Aalst, 2020). These questionnaires have not adequately defined the inherently ineffable nature of contemplative constructs and surveys cannot capture the transformative experiences of practitioners. Researchers can add this missing information through qualitative inquiry on individual and collective perspectives of yoga and contemplative practice (Beck et al., 2017; Lutz et al, 2015). When researchers pair quantitative survey data with accounts of practitioners’ experiences, they can develop a more comprehensive picture of how and why people find yoga and contemplative practice helpful through a mixed methods approach (Beck et al., 2017; Lutz et al, 2015)
Mixed methods studies on yoga and other mindfulness programs in college students are scarce in current literature, as most of the empirical evidence has relied on quantitative results from self-report questionnaires. While qualitative data is not as common as quantitative information on studies of yoga in higher education, this type of data can also offer important insights during this challenging time of defining a “new normal.” Thus, this gap in how past researchers have employed methods to explore this phenomenon supports a rationale for a mixed method approach. The addition of qualitative perceptions and reflections from practitioners can provide context for the quantitative evidence base when paired together within a study (Creswell & Plano Clark, 2017). In addition, a mixed methods approach can add to the existing literature by providing specific details on how stress changes with frequency of yoga practice and giving voice to the missing student perceptions about the particular ways in which yoga supports wellbeing.

Researchers triangulate multiple types and sources of data to add greater value to mixed methods design, as opposed to gathering disparate quantitative and qualitative data in separate studies (Creswell & Plano Clark, 2017). Triangulation also offers the opportunity to compare quantitative data with qualitative input for points of convergence and divergence (Creswell & Plano Clark, 2017). Additionally, researchers have documented the need for qualitative data on yoga and stress to develop better quantitative measures, prompting another reason to use an explanatory sequential mixed methods design (Creswell & Plano Clark, 2017; Lutz et al., 2015).

The intent of this explanatory sequential mixed methods study (quan→QUAL) was to describe how a semester-long yoga course provides a method for improving psychological wellness among college students. I utilized a two-phase, explanatory sequential mixed methods design where I collected quantitative survey data and then explained the quantitative results with
in-depth qualitative data from a smaller sample of student reflections (Creswell & Plano Clark, 2017). In this approach, first I administered the Perceived Stress Scale to measure the levels of college students (n = 121) perceived stress at three points in a semester and then assessed changes in their perceived stress during the semester-long yoga course. In the follow-up qualitative phase, I selected a smaller sample of students (n = 27) within each of the four stress levels (high, high-moderate, low-moderate, and low) on the first data point and analyzed their reflective journals and assignments to shed light on how yoga works to improve wellness. Next, I will discuss how I gathered detailed information on students’ experience of changes in wellness during the semester in the exploratory second phase.

In this explanatory sequential design, I treated the quantitative data as a preliminary measurement with a greater emphasis on the qualitative experiences of college students. I used the PSS scores primarily to identify student cases with varying levels of stress for comparison through document analysis. Then I focused on the student reflective assignments and journals to gather student input. I learned how the participants perceived that yoga works to reduce stress, what aspects of the course were most/least helpful, and what additional dimensions of wellness were impacted by contemplative practice. Additionally, the qualitative data connected to the quantitative measures by offering specific reasons for increases and/or decreases in perceived stress.

Next, I will discuss the two methodologies that informed this mixed methods design: survey and case study. I chose survey design to capture an overview of changes in students’ stress in the larger sample and then a case study approach to explain changes in wellbeing at the student level. I married the positivist survey design with a constructivist case study approach for a comprehensive examination of the college student experience in the yoga course. I collected
quantitative data on perceived stress at three points during the semester using survey methodology, and a naturalistic case study approach to bound the qualitative information I gathered from student reflective assignments including initial reflections, daily journal entries, and final reflections for comparison across cases.

**Survey Design**

I selected a survey design for the first phase of this study to collect preliminary quantitative data at three points during the semester. Creswell and Guetterman (2019) noted that researchers commonly utilize survey research in education because survey questionnaires can gather information from a large sample to summarize perceptions, attributes, and beliefs of a group. While researchers cannot determine cause and effect through survey data, they can illustrate correlations between variables by analyzing the participants’ responses (Creswell & Guetterman, 2019). Teacher-researchers may employ survey data to determine the perceived effectiveness of curricula (Creswell & Guetterman, 2019). Researchers select survey questionnaires carefully to ensure that the desired concepts are measured correctly, and pilot test any new surveys to check for validity (Creswell & Guetterman, 2019). Researchers also need to consider the potential for response bias within surveys as participants may choose certain answers to please the researcher. I evaluated the benefits and drawbacks of survey design, and decided to administer an existing, validated questionnaire to gain a big picture overview of how students' perceived stress changes across the semester and in correlation with their frequency of yoga practice. I collected the quantitative survey data via Qualtrics using the Perceived Stress Scale (PSS) with additional questions on frequency of yoga/mindfulness/meditation practice and demographic details.
Researchers often employ the validated Perceived Stress Scale in studies surrounding psychological wellness and yoga or mindfulness programs (Cohen et al., 1983). Specifically, the PSS has demonstrated reliability and validity within the college student population in a review of previous research with Cronbach’s alpha >.70 (Lee, 2012). The short-form scale contains 10 questions related to stress and control over the past month. Four questions are reverse coded and frame the questions as positive stress management instead of feeling a lack of control (Cohen et al., 1983). In particular, researchers can use a quantitative survey design to gather basic information from a large sample and then follow up with in-depth exploration of a smaller sample in a qualitative approach such as case study (Creswell & Plano-Clark, 2017).

**Case Study Approach**

In this study, I utilized a naturalistic case study approach which Abma and Stake (2014) have suggested for health science research. The case study approach is also appropriate for a teacher-researcher who can clearly identify bounding and the ways that groups of students interact within a class. While in the past, researchers have used case study approaches to explore student experience in college yoga courses, this variant differed in that I bound the cases by students within the same stress level (high, high-moderate, low-moderate, or low) which offered opportunity for cross-case comparison (Villate, 2015). I was then able to follow the student cases who noted different levels of perceived stress at the beginning of the semester and document their transformative journeys during the course. I implemented Stake’s (1995) naturalistic case study design, which combined with my role as teacher/researcher and a constructivist viewpoint provided a method for better understanding the experiences of college students enrolled in a semester-long yoga course.
Limitations

This study did have several limitations that I will discuss in greater detail next including teacher/researcher bias, participant bias, and the lack of a control group. The first limitation is an ethical issue that I needed to consider carefully as I was both the researcher and the instructor for three of the sections involved in the study. Secondly, participants also may have responded differently since the research was conducted during their coursework. Finally, I did not use a control group, and this limited generalizability.

Teacher/Researcher Bias

As a teacher for three out of the eight sections of Yoga 1, I hold the dual role of teacher and researcher. My close involvement with student participants could have potentially biased the data. While I did remove identifying details from PSS data and students’ reflective assignments, there is the possibility that my knowledge of some participants influenced how I interpreted the results. I engaged in constant reflexivity and memoing to reduce this bias. While teachers can bias results by studying their own classes, they also have the insider perspective of a practitioner that is needed for the research foundation. Teacher-practitioners understand the experience of yoga on many levels and know how to practice yoga to create that state of consciousness. Non-practitioners cannot truly teach yoga void of extensive self-study. Additionally, all faculty members teaching this Yoga 1 course have decades of extensive training and experience with contemplative practice.
**Participant Bias**

Participants and their responses may also have been biased in several ways. First, students volunteered to participate, and I did not randomly select participants for the quantitative portion of the study, so it is possible that those students who completed the study were more invested in the yoga course. Second, students may have responded more positively to gain instructor or researcher approval even though students' participation did not impact their grades. Third, the participants all attend a predominantly white institution that is not representative of the greater population. Since yoga courses are included in the tuition and part of the students’ schedule, students do not face common barriers of money, access, and time for yoga practice and administrators may consider this an important detail when interpreting the results and planning future programs (Bamber & Schneider, 2020; Marques, 2018).

**Lack of Control Group**

I did not use an experimental design with a control group, so students may have experienced the same benefits in a different physical education course or a positive psychology course. While I considered comparing the data for the yoga participants to students in a different course, I opted to save that for future research. I wanted to focus on how students experienced the yoga course, and to understand what students shared about why yoga was important to them. The knowledge gained from this in-depth study can inform future research with a control or comparison group.

**Definition of Terms**

**Yoga:** The traditional eight-limbed path of classical yoga includes moral and ethical precepts, postures, breathing techniques, sense withdrawal, concentration, meditation, and integration of blissfulness (Hartranft, 2003). Many people recognize yoga as a system of physical
postures for exercise, but also includes meditation and mindfulness practices (Beck et al., 2017; Breedvelt et al., 2019; Hartranft, 2003).

**Meditation:** The practice of observing the mind in a deliberate way through any one of a range of techniques. Scholars have divided meditation into two general categories of focusing attention (on a word, breath, etc.) versus open awareness (sitting and observing) (Lutz et al., 2015). Meditation is essential as one of the limbs of classical yoga, and mindfulness is a key element of yoga as a practice (Beck et al., 2017; Hartranft, 2003).

**Mindfulness:** According to the Cambridge Dictionary, this is “The practice of being aware of your body, mind, and feelings in the present moment, thought to create a feeling of calm” (n.d., n.p.).

**Mindfulness-based Stress Reduction (MBSR):** Jon Kabat-Zinn developed this secularized eight-week curriculum based on Zen Buddhist meditation and yoga. (Beck et al., 2017; Breedvelt et al., 2019; Kabat-Zinn, 2003). Kabat-Zinn (2003) defined mindfulness as “paying attention, on purpose, in the present moment, non-judgmentally.” (p. 145).

**Mindfulness-Based Interventions (MBIs):** These programs that have evolved out of MBSR may or may not include yoga and/or meditation (Bamber & Schneider, 2020; Breedvelt et al., 2019).

**Salutogenesis:** Antonovsky (1987) coined this term to describe efforts to maintain health and prevent “dis-ease”. As modern medicine reduced the impacts of acute illness, chronic diseases increased as did the need for disease prevention through wellness. Antonovsky (1987) pioneered the field of health promotion by identifying stressors and coping resources as critical elements of salutogenesis.
**Stress:** According to the American Psychological Association (2020), stress is a natural reaction to the pressures of daily life, but stress becomes problematic when unmitigated stress is high enough to interfere with normal activities. Selye was the first researcher to develop stress theory and note that physiological and neurobiological responses to stress can lead to illness in 1935 (Selye, 1993; Tan & Yip, 2018).

**Traumatic stress:** People who have perceived or actual fear of the loss of life or identity as a result of a single or series of events often experience traumatic stress that can become post-traumatic stress disorder (Van der Kolk, 2015). According to the Substance Abuse and Mental Health Services Association (2014), trauma “results from an event, series of events, or set of circumstances experienced by an individual as physically or emotionally harmful or life-threatening with lasting adverse effects on the individual’s functioning and mental, physical, social, emotional, or spiritual well-being” (p. 7).

**COVID Stress Syndrome:** Taylor et al. (2020) coined this term to identify people who experience multiple aspects of anxiety regarding the coronavirus pandemic and are likely more prone to negative mental health consequences.

**Collective Trauma:** When a community or group of people endure a shared traumatic event such as COVID-19, they develop a common identity surrounding the feelings of despair with variation based on individual resiliency and experience of the event (ACHA, 2021).

**Summary**

There is unmistakable evidence that college students have been experiencing high levels of stress for decades and many are likely to be diagnosed with post-traumatic stress as a result of the COVID-19 pandemic as we move forward into a “new normal” (Galea et al., 2020; Hoyt et al., 2021; Reger et al., 2020). Yoga, meditation, and mindfulness provide a path for
downregulating the nervous system and managing stress for better health outcomes (Bamber & Schneider, 2016, 2020; Breedvelt et al., 2019). University administrators may wish to ensure that contemplative practice programs are widely available on college campuses, but also develop programming that meets the specific needs of this population.

In the next chapter, I will review the existing literature on how stress affects health, define the foundations of yoga and contemplative practices for wellbeing, illustrate the ways that college students benefit from contemplative practices, and describe how to utilize this knowledge within the context of a global pandemic. I will also describe the theoretical framework that informed my research on stress and yoga among college students from an integrative, experiential, and salutogenic perspective.
Chapter II: Literature Review

Researchers who understand the value of yoga and contemplative practices have worked for decades to add to the knowledge base on the many ways that these ancient traditions can improve wellbeing in today’s world. Many people have begun to practice yoga in the last few decades to reduce stress, and yoga and contemplative practice have become even more critical for coping skills and self-care during the coronavirus pandemic. No one could not have imagined the extent of collective trauma as a result of social isolation, remote learning, economic losses, xenophobia, and large-scale illness and death.

The Centers for Disease Control (CDC) has gathered preliminary statistics on the rising levels of depression, anxiety, and post-traumatic stress, but people are still finding a path forward into a “new normal” while the COVID-19 pandemic continues to affect individuals worldwide (Vahration et al., 2021). In addition to the alarming CDC statistics citing that 25% college-aged young adults considered suicide in the Spring of 2020, the CDC also noted exponential increases in rates of anxiety and depression in this age group (Vahration et al., 2021). Public health experts have also noted rising incidence of substance use, declining physical health, and disordered sleep patterns (American Psychological Association [APA], 2021).

The coronavirus pandemic has offered an opportunity to refocus on physical and emotional wellbeing from a holistic perspective. Yoga and contemplative practice offer one possible set of strategies for coping with COVID stress and trauma, and college students may find benefit in these courses that set aside time for self-care. In this literature review, I will: (a) provide an overview of stress and health, (b) define yoga and discuss the foundational research on how contemplative practices can improve wellbeing, (c) explain the ways that college
students may benefit from yoga courses as part of the curriculum, and (d) describe how yoga and contemplative practice are particularly relevant during a global pandemic.

**Stress and Health**

Most people would likely say they understand what “stress” means, but the complex balance between good stress and bad stress is typically overlooked (Eriksson, 2017). During the past 50 years, many researchers have studied how stress affects human physiology from different perspectives. Antonovsky (1979) saw stressors as inevitable, and he noted that some people manage stress with enough generalized resistance resources (coping and support systems) to make meaning out of chaotic events (Eriksson, 2017). Thus, although stress is not inherently negative, an inability to balance stress leads to poor health behaviors and outcomes (Allen et al., 2019; Antonovsky, 1979; Cohen et al., 1997; Eriksson, 2017). Cohen et al. (1997), developers of the Perceived Stress Scale (PSS), noted this ambiguity and found common ground in the idea that stress is a process where “environmental demands tax or exceed the adaptive capacity of an organism, resulting in psychological and biological changes that may place persons at risk for disease” (p. 3).

Researchers have focused on stress after discovering that people can control their reactions to stress with the right tools and supports, and consequently prevent imbalance from developing into more profound physical and psychological illness (Antonovsky, 1979; Cohen et al., 1997). People endure excessive stress prior to developing anxiety and depression but may not understand that they can dampen symptoms of stress before they develop more serious illnesses such as cardiovascular disease or anxiety disorders (Antonovsky, 1996).

Instead, some people unconsciously sabotage their health when they feel stressed by overeating, drinking excessive alcohol, smoking cigarettes, and exercising less frequently (Park
& Iacocca, 2014). When individuals choose poor health behaviors as a coping strategy, they increase the risk of stress-related disease (Park & Iacocca, 2014). People may mistakenly assume that they cannot avoid or control stress or they may lack the resources to alleviate stress (Allen et al., 2019; Antonovsky, 1979; Eriksson, 2017). Researchers have clarified distinct types of stress and how stress works on a neurobiological level, and this is vital information to consider when developing stress reduction programs. Next, I will discuss the history of stress research and how our nervous system responds to stress before explaining the ways that yoga can provide a remedy.

**History of Theoretical Models on Stress**

In 1935, Selye introduced stress theory and noted the physiological and neurobiological responses to stress that can become illness (Selye, 1993; Tan & Yip, 2018). Antonovsky (1979) later investigated why some people, including Holocaust survivors, recovered from incredibly traumatic experiences, while others with the same experiences became chronically ill or depressed. He continued his research and eventually identified that individuals within lower socio-economic groups (commonly marginalized people of color) also endure greater chronic stress and related illnesses (Antonovsky, 1979). Antonovsky (1979) proposed that coping resources and support systems could prevent the damaging effects of stress and maintain health. These early researchers pioneered the studies connecting stress and wellbeing, and they paved the way for deeper investigations into how stress can negatively affect the brain and cognition (Leitch, 2017; McEwen & Morrison, 2013; Schwabe & Wolf, 2010; Van der Kolk, 2015).

**Stress Changes the Brain**

In the current era of technology and globalization, researchers and physicians have identified stress as a source of discomfort and disease (Leitch, 2017; McEwen & Morrison, 2013;
Schwabe & Wolf, 2010; Van der Kolk, 2015). While stress has many colloquial definitions, researchers have delineated negative impacts from chronic stress, traumatic stress, and post-traumatic stress disorder (PTSD) as these provoke intense and/or long-term responses (McEwen & Morrison, 2013; NCSEA, 2019; Van der Kolk, 2015). Researchers are just beginning to develop theories on how people have been affected by COVID-19 stress and collective worldwide trauma.

Chronic stress in this context refers to an individual’s experience of being continuously overwhelmed by complex life circumstances without adequate support or coping skills (von Lindern et al., 2017). Traumatic stress relates to a perceived or actual fear of the loss of life or identity as a result of a single or series of events (Van der Kolk, 2015). Individuals often feel the impacts of traumatic stress long after the triggering event has passed with negative impacts throughout their body.

After a traumatic event, some individuals recover to varying degrees, while others may be unable to function in daily life and be diagnosed with PTSD. Complex trauma and toxic stress are other terms used along this negative stress continuum that eventually all become traumatic stress (Blodgett & Dorado, 2016; NCSEA, 2019). All types of negative stress, including traumatic stress and chronic stress, can have lasting impacts on physiological structures and impair brain functions like thinking and learning, and require intervention for improved cognitive and social emotional growth (Leitch, 2017; McEwen & Morrison, 2013; Schwabe & Wolf, 2010; Van der Kolk, 2015).

**Neurobiology of Stress and Trauma.** The field of stress research has branched into neuroscience over the past few decades to include a new understanding of how stress impacts the brain, nervous system, and ultimately the entire body (Leitch, 2017; McEwen & Morrison, 2013;
Schwabe & Wolf, 2010; Van der Kolk, 2015). When an individual suffers from traumatic stress as a result of an acute event, their nervous system reacts in a similar repetitive cycle as with chronic stress because the trauma is continuously re-experienced with exposure to the smallest reminder (Leitch, 2017; McEwen & Morrison, 2013; Van der Kolk, 2015). The constant re-living of traumatic stress and severe chronic stress both result in functional and structural changes in many areas of the brain and nervous system (Leitch, 2017; McEwen & Morrison, 2013; Sherin & Nemeroff, 2011; Van der Kolk, 2015). Researchers have questioned but not determined whether there are preexisting differences in the individual physiology, such as a smaller hippocampus or low cortisol levels, that make some individuals more vulnerable to PTSD (Sherin & Nemeroff, 2011).

Researchers are now able to observe traumatic stress responses in brain structure and function, neurotransmitters, and across body systems. Neuroscientists have identified differences in major areas of the brain including the medial prefrontal cortex (PFC), hippocampus, and amygdala in individuals who have experienced traumatic stress (Leitch, 2017; McEwen & Morrison, 2013; Sherin & Nemeroff, 2011; Van der Kolk, 2015). Neurotransmitters send chemical messages from these areas of the brain to the nervous systems and subsequently control physiological responses throughout the entire body in feedback loops (Leitch, 2017; McEwen & Morrison, 2013; Sherin & Nemeroff, 2011; Van der Kolk, 2015). Serotonin, norepinephrine, and dopamine are neurotransmitters related to emotional regulation that are typically abnormal in patients treated for PTSD (Leitch, 2017; McEwen & Morrison, 2013; Sherin & Nemeroff, 2011; Van der Kolk, 2015). The brain and nervous system do not function in isolation, and constantly send and receive messages from all other systems. Thus, every cell in the body attends to
thoughts in the brain, and then reacts to the subsequent activation of the nervous system (Leitch, 2017; McEwen & Morrison, 2013; Sherin & Nemeroff, 2011; Van der Kolk, 2015).

When there are abnormal interactions between the traumatized brain and chemical messengers, the autonomic nervous system (ANS) suddenly shifts into (and between) hypo (abnormally low) and/or hyper (abnormally high) arousal levels (Leitch, 2017; McEwen & Morrison, 2013; Sherin & Nemeroff, 2011; Van der Kolk, 2015). Additionally, veterans with PTSD may have below normal levels of the stress hormone, cortisol, while individuals with other traumatic and chronic stress experiences may have significantly elevated cortisol (McEwen & Morrison, 2013, Van der Kolk, 2015). While the details can be confusing without a basic understanding of neuroscience, everyone can easily recall the physical sensations associated with stress or trauma - elevated heart rate, “butterflies” in the stomach, and shallowness of breath are just a few common symptoms.

When a traumatic event occurs, the nervous system immediately responds with fight or flight (or freeze) response systems, respectively hyper/hypo-arousal. These systems are also activated every time the past trauma is triggered by some small environmental cue. An example would be a veteran hearing their newborn baby crying and experiencing a flashback to seeing a child killed in war (Van der Kolk, 2015). When a trauma survivor experiences a flashback, they feel as though the actual trauma is happening all over again, and the nervous system responds to that same level of shock. This repeated reactivation of the nervous system causes permanent changes to individual emotional reactions to everyday stimuli and effectively shuts down normal responses and the ability to form new cognitive patterns (Leitch, 2017; McEwen & Morrison, 2013; Sherin & Nemeroff, 2011; Van der Kolk, 2015). Once the traumatic feedback loop
becomes well established in the body, it will continue to impair brain and nervous system physiology unless action is taken to stop the cycle (Leitch, 2017; Van der Kolk, 2015).

**Traumatic Stress.** While all humans have experienced some degree of trauma in living daily life, there are also specific events that cause more severe psychological harm resulting in post-traumatic stress for individuals and communities. According to the Substance Abuse and Mental Health Services Association (2014), trauma “results from an event, series of events, or set of circumstances experienced by an individual as physically or emotionally harmful or life-threatening with lasting adverse effects on the individual’s functioning and mental, physical, social, emotional, or spiritual well-being” (p. 7). The entire human species is currently experiencing a mass traumatic event as a result of the 2019 Coronavirus pandemic, and researchers have just begun to detail the extent of the psychological devastation that will affect many people worldwide (Galea et al., 2020; Reger et al., 2020).

**COVID Stress Syndrome.** Researchers, educators, and public health officials quickly identified the potential for declining mental health as the coronavirus pandemic forced lockdowns and isolated individuals worldwide (Galea et al., 2020; Reger et al., 2020; Taylor et al., 2020). People experienced a myriad of challenges in addition to potential illness, and this constant state of worry was devastating to mental health. Researchers named this constellation of anxieties as COVID Stress Syndrome and developed a scale to identify individuals who needed mental health services (Taylor et al., 2020).

Researchers have speculated that contemplative practice and yoga can ameliorate the negative effects of COVID stress and anxiety based on past research. The preliminary research supports the use of mind-body health practices including meditation, mindfulness, and yoga to reduce COVID stress (Bardeen et al., 2021; Taylor et al., 2020). When individuals can control
what they pay attention to, they are able to halt cycles of obsessive worry and news checking (Bardeen et al., 2021; Taylor et al., 2020). If people have resources and skills to manage their responses to stress, they can prevent more serious consequences of anxiety, significant mental illness, and physical disease (Antonovsky, 1979).

**Stress and Holistic Wellbeing**

Researchers and doctors have failed to neatly capture the concept of stress partly because stress is unavoidable with expansive impacts to human physiology. Stress does not only affect the mind or the nervous system but has systemic influence on every cell of the body (Brinsley et al., 2020; McEwen, 2017; McEwen & Morrison, 2013). Additionally, individuals respond differently to the same stressors based on their past history surrounding trauma and stress combined with their current support resources. Some people may outwardly appear angry when stressed, while others shut down and isolate themselves (Van der Kolk, 2015).

While individuals exhibit differing visible signs of extreme stress, their internal responses are even more intricate. Researchers and physicians have linked poor stress management to cardiovascular disease and obesity (Brinsley et al., 2020; McEwen & Morrison, 2013; McEwen, 2017). Humans have complex physiology that cannot be compartmentalized, and yoga and contemplative practice offer a comprehensive path to stress-related disease prevention and treatment (Brinsley et al., 2020; Siegel, 2007). Yoga is a salutary, or health promoting, and holistic approach to creating wellbeing of mind, body, and spirit (Bhavanani et al., 2019; Doomra & Goyal, 2020).

**Yoga and Contemplative Practices as a Path for Wellbeing**

Neuroscience researchers have confirmed that mindfulness practices such as yoga can reduce stress responses by measuring changes in the brain using function Magnetic Resonance
Imaging (fMRI) techniques (Siegel, 2007; van Aalst et al., 2020). These studies have demonstrated that what people pay attention to contributes to wellbeing in a variety of domains (Siegel, 2007; van Aalst et al., 2020). When individuals are aware of their thoughts (especially negative habitual patterns) and direct attention to present moment sensations, the neurons and brain pathways are also strengthened (Siegel, 2007; van Aalst et al., 2020). When an individual obsessively engages in worry or negative thoughts, these habitual responses contribute to neuronal fight or flight stress responses, while the positive thoughts of attention to the present moment equally relaxes neurons into the rest and digest relaxation responses (Siegel, 2007; van Aalst et al., 2020).

Practitioners experience positive changes in the brain that are not temporary, and researchers have identified structural and functional changes in yoga practitioners’ brains including higher prefrontal cortex activity, increased connections in the default mode network, and growth of grey matter in the insular cortex (van Aalst et al., 2020). People rely on the prefrontal cortex for emotional regulation and appropriate responses, and this area is still maturing in young adult brains (van Aalst et al., 2020). When people first begin to observe their thoughts in mindfulness and meditation, they often notice the natural tendency towards negativity and self-criticism. The default mode network is responsible for this doom and gloom, and researchers theorize that these thoughts protected earlier humans from acute events that could result in death (Lutz et al., 2015; van Aalst et al., 2020).

In the modern world, people do not benefit from constant worrying over low level harms that puts the nervous system on alert. The brain and neural network impacts extend through the entire body system and play a role in health and disease states throughout systems (McEwen & Morrison, 2013; Siegel, 2007). When individuals cultivate positive thought patterns and calm
their neural networks through mindfulness and yoga, they may create a sense of wellbeing throughout their body (van Aalst et al., 2020). Research using neuroimaging is costly and presents many challenges but has provided preliminary insight into how contemplative practice changes the brain as the command center for the entire person. Neuroscience researchers in yoga have faced similar criticisms as researchers relying on other methods including small samples, heterogeneous interventions, and lack of control groups (McEwen & Morrison, 2013; Siegel, 2007; van Aalst et al., 2020).

Modern scientists have sought to quantify pathologies and treatments into operationalized concepts, and this reductionist approach can be especially challenging for ancient wisdom traditions that focus on holistic wellbeing (Brinsley et al., 2020; Patwardhan et al., 2015). In reality, human physiological responses cross physical and mental boundaries, and that all-encompassing nature may be why mind/body approaches are effective as a holistic method (Brinsley et al., 2020; Patwardhan et al., 2015). Excessive and traumatic stress not only harms the mind, but also the body. People with chronic stress are more likely to suffer the additional consequences of a mental health diagnosis and also co-existing physical ailments of obesity and diabetes (Brinsley et al., 2020). Practitioners of yoga and contemplative practice do not only experience relief in one dimension of wellness but express improved overall health on all levels (Brinsley et al., 2020). Still, researchers continue to struggle with adequate definitions for what yoga is exactly – what types of yoga work, how long does it take, how much practice, and what outcomes can be reasonably expected. I propose that understanding the historical journey of yoga from a practitioner perspective helps define the variables involved in determining a yoga prescription.
The Struggle to Define Yoga

People first practiced yoga over 5,000 years ago, but yoga scholars and researchers still struggle to define this embodied contemplative practice today. The meaning of yoga has varied across time, geography, and culture. Modern yoga in the United States does not resemble the ancient tradition from India but is still rooted in the spiritual leanings of the Eastern world (Desai, 2004; Ergas, 2014; Feuerstein, 1998). Yoga practitioners represent a wide range of experience and beliefs. Many people simply enjoy the physical practice of postures as exercise for strength and flexibility (Cramer et al., 2016; Ergas, 2014). Other yoga followers choose a path that focuses on meditation and chanting instead of a movement-based practice (Cramer et al., 2016). Thus, scholars and researchers continue to debate exactly what yoga is and how yoga works so magically to create wellbeing because of the broad spectrum of the yogic tradition (Desai, 2004; Ergas, 2014; Feuerstein, 1998). In this discussion of the scope and definition of yoga in scholarship, I will (a) provide an overview of relevant yoga history and philosophy, (b) describe how yoga is represented in mainstream US culture, (c) discuss perceptions and applications of yoga in education, and (d) conclude with the ways that a comprehensive yoga curriculum for college students can clarify the meaning of contemplative education for future research.

Yoga History and Philosophy

Researchers and scholars have disagreed on a concise definition of the ineffable nature of yoga and this challenge is understandable given the breadth and constant evolution of yoga over the past 5,000 years (Desai, 2004; Feuerstein, 1998). Yoga originated in the Eastern hemisphere before the first religion, but the yogic path shared many overlapping beliefs with the early religions of Hinduism, Buddhism, and Jainism that evolved in the same time span and
geographic space (Desai, 2004; Feuerstein, 1998). Additionally, many people who practiced these Eastern religions also incorporated yoga practice and further clouded the intent of yoga. The early people sought to find something greater than the individual self, and this quest for a divine entity is the goal of religious endeavor and is also part of the original yoga path (Desai, 2004; Feuerstein, 1998). Yoga scholars point to the literal translation of the word “yoga” as evidence that this practice is a spiritual search for God consciousness, but there is room for a broader interpretation within the Sanskrit language of yoga (Feuerstein, 1998).

**Interpreting Sanskrit.** Since language is steeped in culture, people translate words from foreign languages based on their own background. Even dedicated yoga scholars encounter this barrier when interpreting Sanskrit, the original language of yoga (Desai, 2004; Hartranft, 2003; Feuerstein, 1998). In Sanskrit, yoga (or yog) means “union”, or “to yoke” at the most literal level (Desai, 2004; Hartranft, 2003; Feuerstein, 1998; Iyengar, 1999). From that starting point, scholars from an array of philosophical and spiritual leanings have added their own perspective when interpreting the Sanskrit texts. They have expanded the core translation into the idea that yoga unites, yokes, and connects on many levels – linking body, mind, and spirit within an individual; connecting the individual self to all other beings; and ultimately uniting towards a higher power (Feuerstein, 1998; Iyengar, 1999). Scholars have traced the theme of yoga as “connection” and “unity” through many eras (Desai, 2004; Feuerstein, 1998; Iyengar, 1999).

The first yogis, between 5000-1500 B.C.E (Before the Christian Era), defined the higher power as God consciousness which aligned with the Hindu beliefs of that era (Desai, 2004; Feuerstein, 1998; Iyengar, 1999). Later (circa 150 B.C.E.), Classical Yoga scholars changed this idea of a divine entity towards a transcendental version of the self (Feuerstein, 1998). Yoga became synonymous with the spiritual quest for the “true self”, but that transcendental self may
still be interpreted as a divine or “God” consciousness in some modern perspectives. One of the foremost yoga scholars, Georg Feuerstein (1998), described this shift as “where the earlier ascetic stood stock-still under the burning sun to win the favor of a deity, the yogin or yogini’s works occurs primarily in the laboratory of his or her own consciousness” (p. 87). Yoga moved from an external ritual directed at God(s) towards an internal quest to master the mind in the transition to the Classical Yoga era. Patanjali, a noted scholar of Classical Yoga, first documented the fundamental shift from God/religion to spirit/self in the *Yoga-Sūtras* sometime between 400 and 200 B.C.E. (Desai, 2004; Feuerstein, 1998; Iyengar, 1999).

**Patanjali’s Yoga Sūtras.** Patanjali wrote the guidebook of the *Yoga-Sūtras*, a collection of short aphorisms, to describe the eight-limbed path of Classical Yoga. His simple words continue to be analyzed by scholars from different belief systems today. Patanjali described yoga as “yoga citta vṛitti nirodha” in the first book of the *Yoga-Sūtras* (Book 1, Verse 2). Scholars have offered a multitude of translations and commentary for these four words, and a common interpretation is that yoga is the cessation/restraint of the fluctuations/modifications of consciousness/mindstuff (Hartranft, 2003; Iyengar, 1999). Scholars have interpreted this statement to mean that yoga can be both an experience and as a practice. A practitioner can experience yoga when the mind is at peace – even if only for a second (Hartranft, 2003; Iyengar, 1999). One can also practice yoga to settle the fluctuations (thoughts) of the mind (Hartranft, 2003; Iyengar, 1999). Patanjali also offered advice on how to achieve the yoga state of consciousness.

The *Yoga-Sūtras* specify that yoga is achieved through practice (*abhyasa*) and non-attachment (*vairagya*), and scholars have also debated the definitions of these two terms. Swami Satchidananda, founder of Integral Yoga Institutes, defined practice as “effort towards steadiness
of mind” and nonattachment as freedom “from craving for objects seen or heard about” (1978, pp. 19-22). Thus, yogis do not only practice through posture routines on a mat, but rather by paying attention in daily life (Birch, 1995; Ergas, 2014). Aurobindo (1993), the father of Integral Yoga, advised students to keep this attention on the heart as opposed to the mind, and cultivating friendliness and compassion are essential practices for any yogi. Scholars also offer many suggestions on nonattachment that range from a Buddhist approach of not reacting or “not getting stirred up” to the ascetic Indian ideal of renouncing excess indulgences (Hartranft, 2003, p. 5-8). The scholarly definitions of yoga through practice and nonattachment are very different from the modern image of a physical movement practice. Patanjali only referred to the physical postures, asana, briefly in the Yoga-Sūtras as part of the eight-limbed path which offered more substantial recommendations for how to practice yoga (Hartranft, 2003; Satchidananda, 1978).

The Eight-limbed Path of Classical Yoga. Patanjali introduced the abstract concept of yoga in the first portion of the Yoga-Sūtras, and then offered practical guidelines through the eight-limbed path of classical yoga (Hartranft, 2003; Satchidananda, 1978). The eight limbs are yama (restraints), niyama (observances), asana (physical postures), pranayama (controlled breathing), pratyahara (sense withdrawal), dharana (concentration), dhyana (meditation), and samadhi (bliss). Novice students generally begin with the more concrete practices of the first four limbs, and these more concrete practices are easier to implement in daily life (Hartranft, 2003; Satchidananda, 1978).

The yamas and niyamas are also known as the ethical and moral foundations of yoga practice and each limb is broken down into five components. The yamas include non-violence, non-stealing, non-greediness, moderation, truthfulness. The niyamas are contentment, cleanliness, discipline, self-study, and surrender. Practitioners have utilized innumerable types of
diverse *asana* styles from gentle and therapeutic to vigorous and demanding that are all within classical yoga. Some *asana* practices include pranayama, controlled breathing, while other classical yoga traditions separate conscious breathing exercises. Students can actively practice and study the first four limbs, while the remaining four are more abstract and incomprehensible.

As students become more aware of the subtleties of the physical sensations, *pratyahara* spontaneously develops and they learn to unplug from external distractions. Scholars considered *pratyahara* as the bridge towards the more abstract, inner practices of concentration, meditation, and bliss that meld together (Hartranft, 2003; Iyengar, 1999; Satchidananda, 1978). Practitioners learn to concentrate through *dharana* using meditation techniques or mindfulness activities, and proceed into *dhyana*, true meditation, when their focus is unbroken. As the yogi attains the eighth limb, *samadhi*, they comprehend the experience of bliss (Hartranft, 2003; Iyengar, 1999; Satchidananda, 1978). While yoga itself is challenging to define, the highest limbs are completely indescribable without actual experience.

Many yogis follow this eight-limbed path to integrate yoga in daily life. Some yoga systems incorporate the eight-limbed path of classical yoga, but not all yoga traditions use this framework. The classical yoga system provides a timeless method for holistic wellbeing and service in the greater community. While the definition of yoga may remain vague, the devoted practitioner sees a clear path for doing yoga and experiencing yoga. However, many people in the United States today do not accurately understand yoga as a system for whole-person growth and health. Researchers have only just begun to define yoga as a pathway for disease prevention and treatment, and they may view the importance of contemplative practice for wellbeing differently based on their own cultural background (Bhavanani et al., 2019).
**Yoga in the United States Today**

While Eastern religions including Buddhism, Hinduism, and Jainism influenced the early definitions and aims of yoga, yoga practice continued to evolve in modern times with globalization of the tradition (Antony, 2016; Bartholomew, 2020). Swami Vivekananda is often credited with bringing yoga to the US with a famous speech at the 1893 Chicago World’s Fair where he spread a modern view of yoga as a spiritual quest for health and enlightenment (Antony, 2016; Bartholomew, 2020). As Western celebrities like the Beatles traveled to India, they brought back Eastern traditions like yoga and meditation and added a Western flair (Bartholomew, 2020). Yoga has been repackaged continuously with cultural shifts in the United States and people continue to debate whether yoga is a mystical religious ritual or a trendy exercise routine (Antony, 2016; Bartholomew, 2020; Ergas, 2014).

Researchers became interested in mind-body practices including yoga, meditation, and mindfulness as more people used these methods for maintaining health and wellbeing in Western culture (Cramer et al., 2016). The 2012 National Health Interview Survey reported 13.2% of respondents practiced yoga in their lifetime and 8.9% have practiced in the past year (Cramer et al., 2016). That means that 31 million adults have practiced yoga at some point in the United States (Cramer et al., 2016). Most yoga practitioners in the United States are white, female, educated, wealthy, and non-Hispanic, and this lack of diversity is a limitation in current yoga research (Antony, 2016; Bartholomew, 2020; Cramer et al., 2016). Survey respondents listed stress, back pain, and arthritis as the top health-related reasons for practicing yoga (Cramer et al., 2016). Approximately 90% of respondents include breathing and meditation in their definition of yoga practice (Cramer et al., 2016). Researchers have captured a cross-sectional glimpse of yoga
participants, but researchers, scholars, and yoga practitioners have yet to describe a complete picture of what yoga is and how it works today.

**Defining Yoga Today.** The debate over yoga’s meaning continues today, and the Merriam-Webster (n.d.) definition further clouds the intent of yoga as “a Hindu theistic philosophy teaching the suppression of all activity of body, mind, and will in order that the self may realize its distinction from them and attain liberation” (n.p.). Merriam-Webster’s alternate definition is better aligned with popular culture and defines yoga as “a system of physical postures, breathing techniques, and sometimes meditation derived from Yoga but often practiced independently especially in Western cultures to promote physical and emotional well-being” (n.p.). Both dictionary entries fail to capture the transformative process of the yoga system, but hint at the two disparate belief systems about yoga today in both research and public view. Next, I will discuss these differing viewpoints of yoga as a spiritual practice versus a physical fitness regimen more thoroughly.

**Yoga as Spiritual Practice.** People frequently misinterpret yoga as a religious practice, and some avoid yoga as contradictory to Christian belief systems (Desai, 2004). While yoga philosophy espouses that it is harmonious with all other religions, there are still references to Hinduism and Buddhism that many followers of other religions find contradictory to their beliefs (Cook-Cottone et al., 2019; *Malnak v. Yogi*, 1979; Wong, 2018). Researchers and educators have noted that perceived religiosity of yoga remains a barrier for many Christians (Cook-Cottone et al., 2019; *Malnak v. Yogi*, 1979; Wong, 2018).

On the opposite end of the religious debate, other practitioners have also appropriated and misused many of the religious deities of Hinduism within their yoga studios and attire (Bartholomew, 2020; Nair, 2019). Teachers from Eastern India have been horrified to see
representations of their most sacred symbols on t-shirts, in bathrooms, and sitting on floors with a seeming total disregard by their United States counterparts (Bartholomew, 2020; Nair, 2019). Many Western yogis have not studied the yogic tradition but have appropriated the spirituality of another culture (Bartholomew, 2020; Nair, 2019).

However, researchers have identified the core element missing in Westernized views of yoga today (Ergas, 2014; Hoyt, 2016; Hyland, 2016). The ethical precepts, yamas and niyamas, are based on the key principle of non-violence. While non-violence is a universal guideline, the concept is also featured in Buddhism for the cultivation of compassion for others and can add to the idea that yoga is religion. This important focal point of ending the suffering of self and others is often glossed over or completely absent from the Western worldview of mindfulness and yoga practices (Ergas, 2014; Hoyt, 2016; Hyland, 2016). People often think of Yoga as synonymous with asana practice, and maybe envision breathing and meditation, as Merriam-Webster defined the practice (Cramer et al., 2016; Merriam-Webster, n.d.).

**Yoga as Physical Practice.** As the yogic tradition gained popularity in the United States, Western-minded practitioners transformed the public view of yoga from a weird, hippie, pseudo-religious activity into a more palatable exercise routine (Antony, 2016; Bartholomew, 2020). The traditional physical practice has also changed significantly. Modern yoga teachers have made accommodations for Western-minded yogis including the Americanization of the Sanskrit posture names, constant expansion of posture sequences to maintain enjoyment, and attention to physiological benefits (Antony, 2016; Bartholomew, 2020). Yoga is now a full-fledged industry in the United States with multiple studios in every town, abundant teacher certification programs, and ubiquitous apparel companies (Bartholomew, 2020).
However, yoga continues to evolve during the global coronavirus pandemic and another shift is on the horizon. Many studios have closed their doors permanently, while others have maintained a strong following through online instruction (Cooper, 2020; Fitzgerald, 2021). Students have connected their physical yoga practice with the importance of connection to community and a teacher (Cooper, 2020; Fitzgerald, 2021). Many practitioners who initially start yoga for physical exercise and health find that they continue for other reasons such psychological wellbeing, social relationships, and spiritual fulfillment (Birch, 1995; Ergas, 2014). As students practice *asana* and experience better physical health, they may decide to add meditation and mindfulness to their practice (Birch, 1995; Ergas, 2014).

**Sometimes Meditation...and Mindfulness.** Yoga may be commonly known for physical postures today, but many practitioners do incorporate meditation and mindfulness (Cramer et al., 2016). Some people perceive meditation and mindfulness as separate practices and not part of the yoga tradition (Birch, 1995; Ergas, 2014). However, meditation is essential as one of the limbs of classical yoga, and mindfulness is a key element of yoga as a practice (Beck et al, 2017; Hartranft, 2003). The practice of yoga is impossible without mindfulness of the present moment, yoga itself is an embodied practice of mindfulness (Hartranft, 2003).

Jon Kabat-Zinn developed Mindfulness-based Stress Reduction (MBSR) as a secular mindfulness practice based on Zen Buddhist meditation and yoga to employ a clearly defined curriculum for research (Beck et al, 2017; Breedvelt et al., 2019; Kabat-Zinn, 2003). Other Mindfulness-Based Interventions (MBIs) that have evolved out of MBSR may or may not include yoga and/or meditation (Bamber & Morpeth, 2019; Bamber & Schneider, 2020; Breedvelt et al., 2019). Researchers have incorporated these more secular mindfulness programs
(with and without yoga) into schools to evaluate efficacy and continue to debate the definition and role of yoga in education.

**Yoga in Education**

Yoga and mindfulness have become popular in schools for a variety of reasons ranging from improving test scores and academic outcomes to replacing detention (Cook-Cottone et al., 2018, 2019). Some schools have school-wide programs that are grant funded and simply seek to improve overall wellness for all students (Cook-Cottone et al., 2018). Other yoga/mindfulness curricula are directed specifically towards “high-risk” or misbehaving “urban youth” and conducted after school hours or implemented as a School-Wide Positive Behavior Support (Accardo, 2017; Cook-Cottone et al., 2018). When students are forced into yoga based on perceived deficits, researchers again miss the point of self-selected contemplative practice for healing. Other schools offer yoga as a physical education elective and even note possible future careers for students who enjoy the class (Long Beach Unified School District, 2020). The use of trendy yoga and mindfulness programs without clear intentions can result in curricular policies that sound appealing to the wider community but may lack merit.

Additionally, educators are very concerned with implementing yoga as a curriculum because of the ongoing debate over whether yoga is spiritual or secular, particularly in K-12 education systems. While higher education programs have more flexibility in defining yoga, the early education definitions reflect the overall culture of yoga. The Supreme Court decided that yoga in the United States is not a religious method and has a secular purpose for wellness education (*Sedlock v. Baird*, 2015). However, by the time the Supreme Court convened on the matter, the Encinitas School District had already removed aspects that the parents objected to including Sanskrit language, chanting, and mantras (*Sedlock v. Baird*, 2015). The secularity of
the revised yoga program resulted in a favorable decision for the school district (*Sedlock v. Baird*, 2015).

While many schools have accepted yoga programming, Alabama just recently overturned a decades-old ban on yoga in schools that was in place because of the religious overtones (*Wong*, 2018). Many parents continue to object to their children practicing yoga on religious grounds, and the discussion on teaching yoga as wellness education continues. As *Wong* (2018) aptly noted:

> Perhaps the biggest obstacle faced by school-based yoga comes down to the fact that everyone has his or her own way of thinking about it. Religious versus secular, meditation versus exercise, exclusive versus inclusive—it’s little wonder that two people might see the same kid doing a warrior pose through completely different lenses. (para. 13)

While there are many unanswered questions on incorporating yoga into K-12 public schools, there is clarity on at least one aspect - secular instruction is more inclusive for all students and aligned with separation of church and state (*Cook-Cottone et al.*, 2019; *Malnak v. Yogi*, 1979; *Sedlock v. Baird*, 2015). A non-religious framework offers a way to evaluate yoga and mindfulness programs to ensure that all students and their families can be comfortable with a curriculum does not conflict with their personal beliefs, culture, or religion (*Cook-Cottone et al.*, 2019).

When diverse groups of students can access a powerful tool for personal growth without cost, there is a more equitable distribution of resources surrounding wellness. Teachers of yoga in higher education can then educate on a more holistic picture of yoga and incorporate both spiritual and secular through a comprehensive curriculum. During young adulthood, college
students are developing their spiritual autonomy and finding a definition of yoga works for their mental and physical wellbeing.

**Yoga and Contemplative Practice for College Students**

A recent national survey of Yoga in America identified that yoga’s popularity has tripled in recent years (Zhang et al., 2021). While educated, white women continued to represent the majority of yoga practitioners, the rate of males who practiced yoga increased at a higher rate between 2007 and 2017 (Zhang et al., 2021). In addition, young adult practitioners also increased significantly during that time frame. Most survey respondents who practice yoga self-identified as being overall healthy, but there was a significant incidence in back pain and headaches among practitioners (Zhang et al., 2021). Researchers noted that most respondents used yoga to support overall wellbeing as opposed to treatment of severe illness, and they recommended that future efforts examine yoga as a preventative tool which aligns with a salutogenic approach to health (Antonovsky, 1979; Zhang et al., 2021). Young adults have been turning to yoga for self-care in increasing number over the past decades, and they are in even greater need of stress management with the changing environment of higher education during the COVID-19 pandemic.

The American College Health Association (ACHA) (2021) offered guidance for universities as they returned to campuses in Fall 2021 and focused on the importance of improving mental and physical wellness for students and faculty. ACHA noted that the Fall 2021 would present significant challenges for higher education institutions despite widespread vaccine availability. Their recommendations suggested that administrators should prepare for controversial decisions on mandatory vaccination and masking requirements and changing guidelines as a result of variants and rising infections (ACHA, 2021). The coronavirus pandemic is far from over, and students and higher education employees faced new struggles in Fall 2021.
ACHA guidelines emphasized that administrators should prepare with continuance of vaccination centers, testing requirements, contact tracing, and isolation/quarantine as necessary. In addition to the structural components required for physical safety during COVID-19, the ACHA (2021) discussed the severity of mental health concerns for the 18–24-year age group during this time. College students have suffered greatly from uncertainty and loss during the pandemic piled on top off existing difficulties of young adulthood (ACHA, 2021). University administrators are likely to focus on positive mental health campaigns that can reach at-risk students and identify those who are struggling.

The ACHA issued a list of risk factors for college students’ mental health concerns including first year students, those identifying within a marginalized group or minority sexual/gender identity, and those with past trauma, chronic illness, and mental health concerns or substance abuse. In addition to traditional counseling and psychological supports, ACHA noted the importance of addressing mental wellbeing at a public health level. Their guidelines specifically suggested offering mindfulness and self-care programs for faculty and staff but did not specify the importance of these resources for students. However, researchers have identified yoga and mindfulness as important public health programs for preventing mental health problems during the pandemic (Boden et al., 2021). Additionally, Conley et al. (2015) found that skills-based training including supervised instruction of mindfulness and relaxation techniques was more effective than other methods for reducing mental health symptoms among college students in their meta-analysis.

College administrators may want to consider how students will interact with health and wellness programs on campus and plan for a variety of methods to reach as many students as possible (Conley et al., 2015). Yoga courses are popular with this age group; and these offerings
can serve as a primary prevention for stress-related illness, reduce symptoms of other psychological ailments, and encourage students to seek out additional help as needed (Conley et al., 2015). Researchers have noted the need for more details on students’ perceptions and beliefs related to contemplative practice so that colleges can develop effective programming (Brems et al., 2016; Conley et al., 2015). Next, this review will discuss the limited evidence base regarding college students’ perceptions and use of yoga.

**Misperceptions, Barriers, and Motivating Factors**

More recently, contemplative practice researchers have addressed the misperceptions surrounding the practice of yoga as a path for cultivating wellness (Brems et al., 2015; Neumark-Sztainer et al., 2020). The misunderstanding of yoga as a physical stretching program limits the potential benefits of the overlooked ethical and meditative elements (Brems et al., 2015). A survey of university health science students (n = 498) on their knowledge of the eight limbs of classical yoga (ethical practices, lifestyle practices, postures, breathing, introspective aspects, concentration, meditative aspects, and liberation) confirmed that the ethical practices were least endorsed across yoga practitioners and non-practitioners (Brems et al., 2015). Students most frequently identified the postures and breathing as essential to yoga practice and this narrow view may hinder the benefits of a more holistic yoga practice providing psychological and spiritual wellness, but a basic introduction to yoga can still be helpful (Brems et al., 2015; Ergas, 2014).

Researchers have identified the importance of understanding the barriers and motivators for yoga practice that exist in addition to the proposed misperceptions. They have identified common barriers of time, cost, lack of information on yoga teachers and classes, and misguided perceptions on prerequisite qualities of flexibility and athletic ability (Brems et al., 2015;
Neumark-Sztainer et al., 2020). Motivating factors included improved health, wellness, pain relief, community support, and athleticism (Brems et al., 2015). Faculty can address barriers to yoga practice among college students by using a well-defined, evidence-based yoga course in the general curriculum (Brems et al., 2015; Villate, 2015). Additionally, faculty should follow culturally responsive and inclusive teaching methods to ensure that members of marginalized groups are comfortable and welcome in classes (Neumark-Sztainer et al., 2020).

Breedvelt et al. (2019) conducted a meta-analysis on the effects of yoga and contemplative practice on anxiety, stress, and depression in higher education; and concluded that there was not enough evidence to support the use of these programs. However, the researchers were mainly interested in results from carefully controlled, randomized trials that clearly defined the intervention, the dose, and the outcomes. Yoga research is very broad but shallow – researchers have explored many types of contemplative practices for a variety of needs, but have yet to identify a specific style, frequency, and length of practice. Additionally, some of the most persuasive evidence comes from practitioners’ testimonials of how yoga and meditative practice have saved their lives (Bamber & Schneider, 2020). However, higher educators do need an understanding of what types of programming have been successful for students on college campuses, and I will provide an overview of the research on yoga as an intervention, as a co-curricular campus activity, and as a comprehensive credit course.

**Yoga and Contemplative Practice as an Intervention**

While yoga and contemplative practice have been recommended as a universal salutogenic practice to maintain positive wellbeing among healthy individuals, researchers have also tested these methods for individuals who are already diagnosed with emotional disorders. Bridges and Sharma (2017) determined that yoga is effective as a treatment for depression in a
review with adult participants of all ages. Researchers found that Kundalini yoga was more effective than stress education but not as effective as cognitive behavior therapy in the treatment of adults with generalized anxiety disorders (Simon et al., 2021). Luckily, practitioners can add yoga to other medical regimens for a holistic approach and do not need to choose just one approach. Brinsley et al. (2020) conducted a systematic review and meta-analysis of yoga as treatment for a variety of mental disorders including anxiety, depression, PTSD, schizophrenia, bipolar disorder, and alcoholism. They found that adult participants experienced reductions in symptoms with increased frequency of yoga practice (Brinsley et al., 2020).

Only a few researchers have investigated yoga as a treatment for mental health concerns in college students. Falsafi (2016) recruited a sample of 90 students with diagnosed anxiety and depression to participate in three different groups – mindfulness intervention, yoga instruction, and a control group – for eight weeks. The participants experienced significant decreases in stress, anxiety, and depression symptoms and increases in mindfulness in both the yoga and mindfulness groups (Falsafi, 2016). Falsafi noted possible explanations of these differences as a result of the overlap between mindfulness and yoga, individual instructor variations, and the varying definitions of both practices. The most important factor is not which one is better, as that myopic perspective misses the point that mindfulness and meditation are both part of yoga practice. As researchers continue to evaluate combinations of contemplative practice and their individual components, they can develop more concrete definitions and recommendations for practice.

Researchers have not explored yoga as a treatment on college campuses extensively, but there is enough information among the general population to support yoga as adjunctive therapy (Bridges & Sharma, 2017; Brinsley et al., 2020; Simon et al., 2021). Additionally, when colleges
make yoga widely available, students may practice to alleviate symptoms of diagnosed mental health conditions without fear of stigma (Conley et al., 2015; Neumark-Sztainer et al., 2020). Students who avoid traditional counseling services or research may be more likely to attend yoga as a co-curricular campus activity or enroll in an elective course (Conley et al., 2015; Neumark-Sztainer et al., 2020).

Yoga as a Co-curricular or Campus Activity

Researchers have documented that college students experience positive changes in overall mood and stress levels regardless of baseline mental health (Falsafi, 2016; Gaskins et al., 2014). Healthy college students who attended twice weekly 75-minute yoga classes that included yoga asana, pranayama (breathing practices), and seated meditation showed statistically significant improvements in mood/affect scores after 14 of 16 sessions (Gaskins et al., 2014). Participants were recruited on the college campus, but the classes were held at a local yoga studio and not a college course. Yoga classes that are held in studios commonly focus on the physical practice of postures, and do not include instruction on the history and philosophy or ethical values of yoga and contemplative practice (Gaskins et al., 2014). When students learn about all aspects of yoga, they may experience additional benefits and a deeper understanding of yoga.

Yoga as a College Course

A few interventional studies that have examined the impact of yoga and contemplative practices on various aspects of stress among college students show promising quantitative and qualitative results. Students (n = 60) enrolled in a semester long college class on the comprehensive eight-limbed path of classical yoga shared common themes of improved calming, perspective, focus, and empowerment in their written reflections (Villate, 2015). These student
anecdotes were very powerful and an important part of evaluating a college level yoga course. Research with additional data from validated surveys at the beginning and end of the semester would provide greater foundation for the testimonials. In addition to the limited research on comprehensive yoga courses and programming, researchers have explored specific meditation, mindfulness, and other mind/body methods that may or may not incorporate yoga (Bamber & Morpeth, 2019; Bamber & Schneider, 2016, 2020; deBruin et al., 2015; Deckro et al., 2002; Eastman-Mueller et al., 2013; Hyland, 2016; Ramsburg & Youmans, 2014; Shapiro et al., 2011).

**Meditation and Mindfulness**

Shapiro et al. (2011) conducted a review of the research on integrating contemplative practices in higher education. They categorized three broad categories where college students can benefit from meditation and mindfulness curricula including improved cognition, enhanced psychological wellness, and holistic development (Shapiro et al., 2011). Researchers have described cognitive aspects related to improved attention, information processing, and performance outcomes (Shapiro et al., 2011). They have frequently measured psychological attributes including stress, mental health, emotion, and psychological wellbeing. Shapiro et al. (2011) emphasized that whole person development of creativity, relationships, empathy, and self-compassion is a desired outcome of holistic education. Researchers have found supporting evidence for mindfulness curricula across all areas three aspects.

In higher education, even small amounts of mindfulness have demonstrated value. Students noted cognitive improvements through better quiz scores after quick and easy mindful meditation techniques (Ramsburg & Youmans, 2014). They enhanced awareness and attention during and after a college mindfulness course that was mostly theoretical with limited practice
College students enrolled in longer term courses also enhanced emotional attributes like self-compassion (Hyland, 2016; Mahfouz et al., 2018; Shapiro et al., 2011). Contemplative scholars have criticized the absence of self-compassion work within many yoga education programs, and only a few researchers have included this objective (Burns & Nolan, 2014; Ergas, 2014; Ergas, 2019; Hoyt, 2016; Wang, 2019). Mahfouz et al., (2018) developed a contemplative curriculum for first year college students, Just Breathe, that focused on building self-compassion, and participants also experienced reduced stress, increased happiness, and emotional stability. The use of mindfulness embedded into course design holistically may have the most benefit for developing empathetic and thoughtful citizens, but researchers and educators may have the greatest struggles in proving these outcomes (Burns & Nolan, 2014; Ergas, 2014; Ergas, 2019; Hoyt, 2016; Wang, 2019).

Additionally, mindfulness studies may not always directly include compassion and empathy in their programs, but it is possible that the components addressing stress reduction through improved wellbeing may have indirect impacts on the capacity to care for others. When people feel better themselves and can manage the stress of daily life, their relationships and interactions with others may also improve (Davies, 2018; Weare, 2019).

Other Mind-body Programs

Researchers have also explored the efficacy of many secularized practices that are founded in yoga and meditation but no longer use the Eastern terminology (Deckro et al., 2002; Eastman-Mueller et al., 2013). The Relaxation Response and Integrative Restoration (iRest) are two well-known techniques that researchers have determined are effective for reducing stress in college students (Deckro et al., 2002; Eastman-Mueller, 2013). Deckro et. al developed a training manual covering a variety of Relaxation Response skills that are often part of yoga practice.
including yoga postures, mindfulness, breath work, and guided relaxation techniques. A group of college students participated in weekly 90-minute classes using these techniques for 6 weeks and had significant improvements in anxiety level and perceived stress as compared to a control group. Benson & Klipper (1975) originally developed the Relaxation Response after studying the Eastern meditation techniques with the intention of finding a secular approach to stress relief for cardiac patients. Researchers have also studied a technique, called iRest, that Richard Miller developed initially for use with veterans with Post Traumatic Stress (Miller, 2015).

iRest is a more secular version of traditional yoga nidra, which means sleeping with awareness, that incorporates deep relaxation and meditative principles. Eastman-Mueller et al. (2013) studied this scripted program in higher education. Participants (n = 66) in an 8-week iRest college course exhibited improved mindfulness and reduced depression (Eastman-Mueller et al., 2013). Taking away the overtly spiritual elements and title of yoga may reduce barriers related to misperceptions of yoga and increase access for groups unlikely to attend yoga classes.

Additionally, people are experiencing the world very differently as a result of the global coronavirus pandemic and researchers need to consider the resulting changes in physical and mental wellbeing and perceptions of yoga and contemplative practice.

**Impacts of the COVID-19 Pandemic**

Researchers have developed a solid evidence base for the use of Yoga as a safe and effective method for improving psychological wellbeing and managing daily stressors (Gallegos et al., 2017; Macy et al., 2018; Sciarrino et al., 2017; Telles et al., 2012). Additionally, researchers have identified yoga as an adjunctive treatment alongside counseling services and medication for individuals with more severe anxiety, depression, and post-traumatic stress (Gallegos et al., 2017; Macy et al., 2018; Sciarrino et al., 2017; Telles et al., 2012). The use of
trauma-informed yoga practices that focus on soothing breathing techniques and postures can calm the traumatized nervous system (Descilo et al., 2010; Gallegos et al., 2017; Gerbarg et al., 2011; Macy et al., 2018; Sciarrino et al., 2017; Telles et al., 2012).

As more people have suddenly experienced greater trauma and stress during the global COVID-19 pandemic, a better understanding of evidence-based guidelines for trauma-informed practices is necessary (Galea et al., 2020; Macy et al., 2018; Reger et al., 2020). The research on yoga and post-traumatic stress can inform the use of yoga breathing and posture practice during a global pandemic of COVID-19, but instructors need a knowledge base for trauma-informed applications across a variety of settings. In this section, I will: (a) discuss the research on psychological trauma that occurs with mass disaster situations with specifics on Severe Acute Respiratory Syndrome (SARS) and coronavirus, (b) investigate how these disasters harm the psychological wellbeing of college students, (c) provide an overview of the challenges in studying interventions to alleviate trauma related to large-scale disaster situations, and (d) close with implications for future research on yoga as a trauma-informed approach.

**Mass Disasters and Psychological Trauma**

While the United States population has not experienced a viral pandemic or mass disaster of this magnitude in the past century, there have been several smaller events nationally and large-scale disasters globally that have offered insight on the impacts to psychological wellbeing in the aftermath of tragedy. The September 11 terrorist attacks, large hurricanes like Katrina, and school shootings including Sandy Hook are recent events that have impacted our collective psychological wellbeing and shaped our worldview in the United States (Descilo et al., 2010; DeRoma et al., 2003; Gerbarg et al., 2011; Hobfoll et al., 2007). Global disasters including the East Asian tsunami, the Haiti earthquake, and post-war devastation in Kosovo, Rwanda, and
Nicaragua have all prompted traumatic responses in large communities (Descilo et al., 2010; Gerbarg et al, 2011).

Mass disasters cause destruction on multiple levels with both short- and long-term consequences. Some people experience direct impacts through illness, injury, or loss of life; and survivors have often noted that the graphic images they witness trigger flashbacks throughout their lifetimes (Hobfoll et al., 2007; Ladd et al., 2007). Additionally, individuals and communities lose a multitude of resources in addition to the devastation of the traumatic event (Hobfoll et al., 2007; Ladd et al., 2007). People accumulate traumatic stress from indirectly viewing gory pictures and horrifying stories in the news and on social media repeatedly during and after mass disasters (DeRoma et al., 2003; Hobfoll et al., 2007). Also, the overall loss of a sense of safety is a foundational threat for human psychological wellbeing (Hobfoll et al., 2007; Ladd et al., 2007). Researchers have identified these common characteristics across mass disasters and have already noted similar complex and traumatic stress during the COVID-19 pandemic (Taylor et al., 2020).

**Impact of SARS and Respiratory Distress.** Previous SARS outbreaks have been confined and limited to Asian countries, and North Americans have not experienced the intense fear of these dangerous, highly contagious viruses until now. Past researchers have noted the importance of addressing the psychological symptoms that occur during the outbreak and persist long after the immediate threats (Chan et al., 2006; Lee et al., 2007). They have also documented elevated levels of anxiety, depression, and post-traumatic stress in survivors of SARS with the highest levels found in healthcare workers (Lee et al., 2007; Reger et al, 2020).

There is also evidence of a considerable risk of continued PTSD after patients with acute respiratory distress syndrome were hospitalized in Intensive Care Units (Kapfhammer et al.,
Health care workers have witnessed the horrors of patients in respiratory distress when they fight intubation and require sedation for comfort during ventilation (Kapfhammer et al., 2004). When the natural pattern of breathing is altered, the nervous system changes as well. Rapid breathing, which is induced through forced hyperventilation, enhances the “fight or flight” response of the sympathetic nervous system (Siegel, 2007). People have also experienced heightened anxiety over shortages of ventilators and sedation medication during the current COVID-19 pandemic (Truog et al., 2020).

**COVID-19 Predicted Impacts.** The initial primary concern for stopping the spread of the highly contagious COVID-19 was for physical health and preservation of life through stay-at-home orders and closure of non-essential businesses. As confinement continued beyond the initial two weeks, professionals noted increased mental health concerns as a result of loss of income, social isolation, and lack of support (Galea et al., 2020; Reger et al., 2020; Taylor et al., 2020). The rising need for mental health services directly conflicted with the closure of natural supports like churches and counseling services (Galea et al., 2020; Reger et al., 2020). Additionally, the effects of physical distancing have prompted immediate telehealth initiatives and public health advice on self-care, but the massive scale of this virus demonstrated a need for creative, widespread programming capable of reaching many people (Galea et al., 2020; Reger et al., 2020). Although everyone has experienced greater anxiety and depression during this time, college students are an overlooked, high-risk subset of the population.

*The Impact of Mass Disasters on College Students’ Mental Health*

Today’s young adults have not experienced any previous disaster at the scale of the COVID-19 pandemic. While the current global pandemic differs from past traumatic events, researchers and public health officials initially looked to historical events to develop support
As coronavirus continued to impact daily life, researchers collected preliminary data to identify how college students were affected and identified ways to better reach those in need (Bardeen et al., 2021; Boden et al., 2021). Next, I will discuss some of the past information on generalized disasters in the United States and previous SARS outbreaks in East Asia and explain how these intersected with early Covid-19 data and recommendations for wellbeing.

**Generalized Disasters in the United States.** Researchers have explored how historical disasters like the 9/11 terrorist attacks and Hurricane Katrina have impacted college students and their psychological wellness (DeRoma et al., 2003; Ladd et al., 2007). The 9/11 terrorist attacks in 2001 were devastating for those old enough to remember, but these events happened before many of today’s college students were born. Researchers identified that news coverage of the 9/11 terrorist events triggered a greater level of PTSD symptoms, and this trauma occurred before the widespread and often inaccurate reports on social media that add to current misinformation and anxiety (DeRoma et al., 2003; Reger et al., 2020). More recently, natural disasters such as Hurricane Katrina in New Orleans closed universities and uprooted over 50,000 college students (Ladd et al., 2007).

Although data is limited, there is a strong indication that current college students need support in times of disaster regardless of socioeconomic status or younger age (Ladd et al., 2007). While some students may receive financial support from their families, the greater majority suffer financial losses (including their homes, jobs, and possessions) during disaster situations (Ladd et al., 2007). Students often incur large student loan debt that will need to be repaid when academics are interrupted for any length of time (Ladd et al., 2007). When students are forced to suddenly leave college, the emotional grief can be devastating as they leave behind
friends, community, and often their pets (Ladd et al., 2007). The social, academic, and psychological harms are all interconnected and additive with potential for significant post-traumatic stress.

**SARS Outbreaks in East Asia.** On a global level, we can look to the earlier 2002-2004 SARS outbreaks in Asia to assess impacts on university students while being mindful of cultural differences (Main et al., 2011). Although there is even more limited research within this specific area, several studies have discussed coping methods during the resulting isolation and disruption to daily life among Chinese college students (Gan et al., 2004; Main et al., 2011).

Patterns of poor coping methods have been identified among college students during past SARS epidemics, and young adults may turn to avoidant behaviors during these types of uncontrollable situations. Avoidant coping methods may temporarily relieve acute anxiety but are not helpful for solving daily problems long term (Gan et al., 2004; Main et al., 2011). There is still a gap in the research on mass disasters, and more specifically SARS, and the resulting psychological trauma among college students. This population clearly needs ongoing research to better define the extent of the trauma and develop an evidence-base for coping strategies and resources (Gan et al., 2004; Main et al., 2011). However, researchers have encountered many challenges and limitations when studying psychological trauma during a mass disaster, and their past work informed this research.

**Rationale for Mind-Body Interventions During a Global Pandemic**

Mass trauma situations have many special considerations, and programs that support psychological wellness need to be flexible and simple with delivery methods that can reach large groups of people simultaneously. Researchers have identified yoga and other body/mind/spirit approaches as an effective complementary approach in managing PTSD that may be extremely
helpful during the current pandemic (Bardeen et al., 2021; Boden et al., 2021; Gallegos et al., 2017; Macy et al., 2018; Sciarrino et al., 2017).

Researchers have incorporated increased use of yoga and breathing techniques following disaster situations, but more research is needed for these cost-effective, sustainable programs (Garberg et al., 2011; Telles et al., 2012). Additionally, yoga breathing techniques may be especially helpful for maintaining and recovering respiratory health during this virus. Techniques like three-part breathing and exhale lengthening slow down respiration, easing the nervous system into the “rest and digest” response of the parasympathetic nervous system (Siegel, 2007). Researchers have applied these body/mind/spirit approaches to manage trauma during and after other types of SARS outbreaks (Chan et al., 2006).

While the evidence base for treating post-traumatic stress in times of mass disaster is limited, a team of global experts agreed the five essential elements of trauma-informed practices of creating safety, calm, self/group-efficacy, connectedness, and hope (Hobfoll et al., 2007). Teachers trained in body/mind/spirit interventions like yoga breathing and movement already follow these best practices and can emphasize the importance of a trauma-informed approach to support wellbeing among larger populations (Bardeen et al., 2021).

**Theoretical Framework**

The theoretical framework for this study incorporated three theories that connect contemplative practice to education and wellbeing as a mindful path for whole-person centered learning and living. Integral/integrative education theory, experiential learning theory (ELT), and salutogenesis combine to form a solid foundation that connects yoga practice to psychological wellbeing through holistic education. Integral and integrative theorists proposed that education should include all areas of life through a mind/body/spirit approach (Esbjörn-Hargens, 2010).
Kolb (1984) advanced the idea in ELT that individuals learn from every experience in daily life, not just from classroom lectures or books. Antonovsky (1979) developed the sociological theory of salutogenesis, which focused on creating wellness to prevent stress-related disease. These three theories all share common intentions that connect to form my theoretical framework, and I will discuss the basic details of each theory starting with integral/integrative education theory.

**Integral/Integrative Education**

One of the earliest documented experiential teachers, Plato, demonstrated the ideals of integral theory through a holistic, experiential approach to learning (Esbjörn-Hargens, 2010). Then Aristotle introduced a lecture heavy model to create the first divide within a “whole” education with philosophical differences (Esbjörn-Hargens, 2010). Integral education is evident throughout history in the naturalized education of Native Americans in the West, and through Sri Aurobindo’s Integral Yoga in the East (Aurobindo, 1993; Esbjörn-Hargens, 2010). Integrative education has carried on the Integral tradition with a focus on a heart-centered, authentic, reflective teaching (Esbjörn-Hargens, 2010; Palmer et al., 2010). While integral and integrative education have numerous and separate origins, these theories overlap through the common view that education should offer holistic instruction of mind, body, and spirit (Esbjörn-Hargens, 2010; Palmer et al., 2010).

The common characteristics of integral/integrative education can be summarized as open and flexible to all ways of learning and teaching, practicing self-reflective activities, balancing thinking with feeling, and connecting within the individual self as well as to the external world (Aurobindo, 1993; Esbjörn-Hargens et al., 2010). The focus of integrative education on connecting inner and outer worlds shares the aims of yoga practice and unity of body, mind, and spirit. Fundamentally, yoga and contemplative practice are examples of an Integral/Integrative
pedagogy (Aurobindo, 1993; Esbjörn-Hargens, 2010). Integral/integrative education and yoga are also both experiential in nature and share many constructs with experiential learning theory (ELT).

**Experiential Learning Theory**

Experiential learning theory (ELT), based on the previous work of Dewey, Lewin, and Piaget, centered experience at the core of learning and whole person growth (Kolb, 1984). Kolb (1984) clearly delineated the goals of ELT in his original work with language that sounds very similar to the Integral/Integrative theorists. Kolb (1984) noted that he did not develop ELT as “a third alternative to behavioral and cognitive learning theories, but rather to suggest through experiential learning theory a holistic integrative perspective on learning that combines experience, perception, cognition, and behavior” (pp. 20-21). Experiential theorists share the belief of integral/integrative theorists that learning is holistic and reflective, but there are also differences and debates within ELT (Kolb, 1984).

Kolb (1984) noted that while Lewin, Dewey, and Piaget all described different approaches to ELT, they all shared the beliefs that learning is about the process more than the outcomes and that learning evolves based on experience. Kolb (1984) also discussed the tensions within ELT and the conflict between acting versus reflecting in daily life. The yogis and Eastern wisdom traditions address this seeming duality with the stance that one develops “right action” through practice and reflection (Hartranft, 2003). The four stages of the experiential learning model (concrete experience, abstract conceptualization, reflective observation, and active experimentation) balance inner feelings with outer experiences to form a holistic methodology with similarities to Integral Theory (Kolb et al., 2001; Esbjörn-Hargens, 2010). Thus, ELT is an
inherently reflective pedagogy, and researchers have connected ELT to high-level wellness, a term used synonymously with salutogenesis (Allen et al., 2019).

**Salutogenesis**

Researchers have posited a variety of theories on stress, but I propose that Antonovsky’s (1979) work on salutogenesis aligns singularly with the intent of yoga and contemplative practice. Salutogenesis is essentially a focus on creating health instead of merely preventing or treating disease (Allen et al., 2019; Antonovsky, 1979). The salutogenic model proposes that there is a continuum of health to “dis-ease” with generalized resistance resources and specific resistance resources that mediate stressful life experiences through a sense of coherence (Allen et al., 2019; Antonovsky, 1979).

The main construct of salutogenesis, a sense of coherence (SOC), refers to what extent the world (a) generally makes sense, (b) is manageable, and (c) feels meaningful (Antonovsky, 1979). Generalized resistance resources (GRRs) refer to the environmental and social supports that surround an individual (Antonovsky, 1979). Specific resistance resources (SRRs) include development of coping skills such as those offered through yoga and mindfulness (Antonovsky, 1979). While I am not referencing the GRRs, SRRs, or measuring a sense of coherence in this study, my work is informed by yoga as a salutary pedagogy for whole person health. The SOC construct is a pivotal element of yoga philosophy through which practitioners seek out ways to make life meaningful, comprehensible, and manageable (Hartranft, 2003).

The mind-body-spirit approach of salutogenesis intersects with integrative education in a practical way by teaching students to prioritize wellbeing (Allen et al., 2019; Antonovsky, 1979). The Handbook of Salutogenesis noted this nexus, “Epistemologically, salutogenesis can be conceived as a constant learning process supporting movement toward health (and other desired
aspects of one’s existence) via improving health literacy” (Eriksson, 2017, p. 92). Salutogenesis adds the essential focus on wellbeing to this scaffolding by melding the *in-situ* nature of ELT with an Integrative Education for mind/body/spirit of the whole learner. Yoga and contemplative practices provide the method for students to achieve a different relationship towards learning and living while caring for their inner self.
Note. The figure above depicts that a salutogenic approach to life provides a lens for yoga and contemplative practices as centered within ELT and Integral/Integrative education theories for a whole-person centered path for living and learning.
Antonovsky (1979) developed salutogenesis following the mass disaster of the Holocaust, because he wanted to figure out why some people navigated life after trauma while others fell apart. As people everywhere struggle with the aftermath of the COVID-19 pandemic, salutogenesis is again relevant in how society prioritizes health and wellbeing (Dorczak et al., 2021). Antonovsky offered a guiding question for public health promotion efforts using the SOC construct, “What can be done in this 'community'—factory, geographic community, age or ethnic or gender group..., etc. —to strengthen the sense of comprehensibility, manageability and meaningfulness of the persons who constitute it?” (1996, p.6). For this study, the community is college students, and yoga as an integrative and experiential learning method may offer a path for young adults to find meaning and make sense of today’s chaotic world.

**Summary**

In this chapter, I provided a review of the relevant literature on stress, yoga, and contemplative practices, and outlined how these intersect to provide a salutogenic path for college students during a global pandemic. I also discussed the underlying theory that scaffolded this study. Next, I will thoroughly describe the study design and methods, and explain why an explanatory sequential mixed methods design was appropriate for this research.
Chapter III: Methods

The purpose of this study was to explore how college students experienced changes in stress and wellbeing while taking a semester-long yoga course during a global coronavirus pandemic. In this chapter, I will provide the rationale for using a mixed methods study with a quantitative survey design and a qualitative case study approach. I will also detail my research methods and share in-depth information on the sample, setting, instrumentation, and data collection and analysis.

Overview

The overarching question for this explanatory sequential mixed methods (quan → QUAL) study was *What are the experiences of college students in relation to wellbeing while enrolled in a semester-long yoga course?* This broad question was addressed through several sub-questions:

1. To what extent does perceived stress among college students change during a semester-long yoga course? (Quantitative)
2. In what ways do students experience changes in wellness throughout a semester long yoga course? (Qualitative)
3. How do college students describe aspects of the Yoga course that support their wellbeing? (Qualitative)
4. To what extent do the quantitative results on perceived stress agree/disagree with the student reflections on the benefits of yoga for psychological wellness? (Mixed methods)

Research Design

In this explanatory sequential mixed methods study, I first employed a survey design to collect preliminary quantitative data and then I randomly selected a purposeful sample for the
qualitative case study approach. During the quantitative phase, participants (n = 121) completed a survey with their basic demographic data, perceived stress levels, and frequency of contemplative practices in the third week of the semester. The survey respondents completed the stress and practice frequency surveys two additional times at monthly intervals in weeks 7 and 11. This phase of the study provided answers to the research question *To what extent does perceived stress among college students change during a semester-long yoga course?* and the first survey provided a basis for sample selection in the second qualitative phase.

After I analyzed the perceived stress data on the first survey, I chose the qualitative sample (n = 32) by randomly selecting an equal number of eight participants from each of the four stratified levels of high, high-moderate, low-moderate, and low stress scores. Then, in the explanatory qualitative phase, I utilized a case study approach to further study the participants’ experiences in each stress category. Five participants did not complete all surveys, and were eliminated from the qualitative sample analysis. I followed the remaining participants who completed all three perceived stress surveys (n = 27) and analyzed their reflective assignments across the course of the semester.

I used the final reflection as an additional data source to triangulate data for a comprehensive case study approach that effectively answered the research questions: *In what ways do students experience changes in wellness throughout a semester long yoga course?* and *How do college students describe aspects of the Yoga course that support their wellbeing?*

Finally, I compared the results of the quantitative and qualitative data analysis to answer the final question: *To what extent do the quantitative results on perceived stress agree/disagree with the student reflections on the benefits of yoga for psychological wellness?* I explored areas of convergence and divergence in the results and sought to explain any gaps in the data. Figure
3.1 presents an overview of the research design and flow of data collection and analysis. I followed this process as Creswell and Plano-Clark (2017) recommended to enact a true mixing of methods that provided key data on yoga students’ perceived stress and then explained how yoga affected their wellbeing.

**Figure 3.1**

*Diagram of Design*

Explanatory Sequential Mixed-Methods Research Design

![Diagram of Design](image)

*Note.* This diagram shows the sequential nature of data collection and analysis of quantitative and then qualitative results.

**Mixed Methods Explanatory Sequential Design**

According to Creswell and Plano-Clark (2017), a mixed methods study design is recommended when a researcher needs a combination of data sources and perspectives to fully address their research problem. Using this study as an example, I would not be able to address the research problem of how a yoga course can alleviate college students’ poor mental health
solely with the quantitative perceived stress scores, nor would I be able to demonstrate how students’ perceived stress scores changed throughout the semester solely by analyzing the reflective assignments. Researchers use a mixed methods design when they need multiple sources of data to balance the strengths and limitations of pure quantitative or qualitative methods (Creswell & Plano-Clark, 2017).

According to Creswell and Plano-Clark (2017), researchers may need to apply a mixed methods design when the initial results cannot stand alone, and the researcher needs additional data to explain the initial findings. The explanatory sequential design is one type of mixed methods that researchers use when they collect quantitative data first, use that data as the basis for selecting a smaller sample, and then qualitatively explore the topic more deeply to explain the initial quantitative results (Creswell & Plano-Clark, 2017). In this study, students in Yoga 1 provided quantitative data on their perceived stress, and then I selected cases of students within different levels of stress for qualitative explanation of how the yoga course impacted their stress and other aspects of wellbeing.

Researchers may know that before planning a study that one worldview or type of data will be insufficient (Creswell & Plano-Clark, 2017). There may be enough quantitative data within their field to provide consensus on a broad problem, but a lack of qualitative input from people who experience the problem. For example, researchers generally agree that people reduce stress when they practice yoga. However, many professionals may be reluctant to recommend yoga because there is insufficient evidence for how and why yoga works. The powerful stories of yoga practitioners are missing and needed to completely answer the research questions.
Researchers have encountered many challenges with measuring constructs like stress, mindfulness, and self-compassion through self-report surveys even though these are considered empirical findings (Bamber & Schneider, 2016; Beck et al., 2017; Lutz et al., 2015). Existing research has mostly examined outcomes of contemplative programs through quantitative surveys including the Perceived Stress Scale (PSS), Five Facet Mindfulness Questionnaire (FFMQ), and the Self Compassion Survey (SCS) in pretest/posttest evaluations after yoga or mindfulness interventions (Bamber & Schneider, 2016; Beck et al., 2017; Lutz et al., 2015). There are several issues with using these questionnaires as the only evidence for measuring efficacy of contemplative programs including the self-reported nature of data, documented problems with construct validity, and reporter bias of survey questions (Lutz et al., 2015). A striking example of these issues was noted in a study that administered the FFMQ to experienced meditators and binge drinkers and found the drinkers more mindful than the meditators (Leigh et al., 2005 as cited in Lutz et al., 2015). That study demonstrates the difficulty of quantifying the essence of mindfulness within a construct on a questionnaire (Lutz et al., 2015).

Bamber & Schneider’s (2020) narrative review summarized the existing qualitative research on college students’ perception of mindfulness programs and illustrated the need for additional qualitative data. The participants were a mix of graduate and undergraduate students, and half of the studies pulled samples from helping professions (Bamber & Schneider, 2020). The 18 studies that were included represented both qualitative and mixed method approaches which indicates the lack of qualitative study in this field (Bamber & Schneider, 2020). Researchers identified overarching themes of importance included awareness, focus, barriers to meditation, and the role of the teacher (Bamber & Schneider, 2020). Participants noted that
mindfulness provided a coping mechanism for stress, improved their relationships, and offered support systems in their future careers (Bamber & Schneider, 2020). Based on this review of the research, I determined that I could more solidly connect qualitative themes to quantitative data through a mixed methods design.

While mixed methods studies on yoga and psychological wellness are another option that could potentially combine the empirical data with participant experiences, few researchers have employed a true mixing of qualitative and quantitative methods. Superficially, a mixed methods approach appears to include the best of both quantitative and qualitative input, but researchers need to be careful to avoid post-positivist leaning that downplays the qualitative portion (Creswell & Plano Clark, 2017). Specifically, qualitative data is very limited if a few open-ended questions are only tacked on to pretest/posttest questionnaires to support the quantitative results (Creswell & Plano Clark, 2017; Eastman-Mueller et al., 2013).

However, when mixed methods researchers incorporate the richness of true qualitative methodology to gain insights into the lived experiences of contemplative practitioners, this may inform future quantitative research and development of more accurate instrumentation (Lutz et al., 2015). In addition to collecting perceptions and experiences of practitioners, qualitative data can also clarify constructs used surrounding stress, mindfulness, and yoga (Crowley & Munk, 2017; Lutz et al., 2015). Mixed methods researchers can implement a complete quantitative method plus a thorough qualitative method and integrate the findings for more comprehensive results (Creswell & Plano-Clark, 2017). In this study, I combined a quantitative survey design with a qualitative case study design for a true mixed methods approach.

A Mixed Methods Study of Yoga and Stress in College Students

I chose this explanatory sequential mixed method design in order to first analyze
quantitative perceived stress data, identify the qualitative sample, and then document students’ qualitative descriptions of how yoga supported stress management and other areas of wellbeing.

While I valued the PSS data, I placed a higher priority on the students’ voices so that I could share their stories of yoga and contemplative practice and learn how yoga helped them during this incredibly stressful time of an ongoing global pandemic. I continuously analyzed the reflective assignments across the semester, and then integrated the qualitative and quantitative results. I compared areas within cases and across cases for convergent and divergent findings of note. First, I implemented a survey design to collect quantitative data, and then a case study approach for qualitative exploration.

**Survey Design.** According to Creswell and Guetterman (2019), researchers may choose a survey design to easily collect quantitative data from a large sample or population and describe trends in a group. Since a survey design is not an experiment, researchers cannot determine cause and effect of an intervention with this method. Researchers employ a survey design when they want to better understand attitudes, opinions, beliefs, and behaviors of a group (Creswell & Guetterman, 2019). Researchers may also utilize survey design to describe correlations in the sample but cannot draw strong conclusions or predict outcomes. Educators frequently use survey design to learn more about students’ perceptions and evaluate programming (Creswell & Guetterman, 2019).

Creswell and Guetterman (2019) described the two main options within survey design as cross-sectional and longitudinal. Researchers gather cross-sectional, or single point in time, data to identify common behaviors and beliefs in a group, while using a longitudinal design to observe changes over time (Creswell & Guetterman, 2019). The cross-sectional survey design is beneficial when researchers need to collect data quickly to evaluate the needs within a
community to develop new programs or evaluate existing programs. Researchers using the cross-sectional design can also compare differences between groups or to national survey respondents. However, in a cross-sectional survey design researchers are limited by factors that influence respondents in that moment of time. Alternatively, researchers use a longitudinal survey design to gather data at multiple time points to observe changes within the same general population, a smaller cohort with a shared characteristic, or a panel that follows the specific people over time (Creswell & Guetterman, 2019).

For this study, I identified that this purpose of a survey design aligned with my intent to collect data from all participants (n = 172) and explore trends in perceived stress. In order to overcome the barrier of low response rate in survey design, instructors administered the surveys during class time by posting a printed QR code for the students to scan with their phones (Creswell & Guetterman, 2019). I collected data at three points in time across the semester for a longitudinal design, and 121 participants completed all three surveys. Creswell and Guetterman (2019) also described different types of longitudinal design as trend studies, cohort studies, and panel studies. In this study, a cohort of students enrolled in a Yoga 1 class reported their perceived stress as the common characteristic across the time frame of the college semester.

In summary, I followed Creswell and Guetterman’s (2019) recommendations for sampling within survey research by working from a large sample, using a reliable instrument, and encouraging a high response rate. The survey design was an effective method for collecting and analyzing the quantitative data, and then I implemented a case study approach to explore the qualitative connection between yoga and stress in college students.

**Case Study Approach.** I adopted a case study approach to guide the qualitative portion of this study. As a researcher, I was interested in the specific and unique details of how students
experienced this particular Yoga 1 course. Additionally, I wanted to understand the “how” and “why” of yoga as a coping tool for students with different starting circumstances. Finally, I conducted the research during an indescribably challenging time of an ongoing global pandemic. I identified that a case study approach aligned with these characteristics of exploring a phenomenon to better understand what is happening for a bounded case within a special context (Baxter & Jack, 2008; Stake, 1995; Yazan, 2015). Yin (1981), Merriam (1985), and Stake (1995) have offered differing perspectives on case study approaches from contrasting worldviews and belief systems that researchers can choose from to follow as a framework.

Yin (1981) viewed case study from a positivist worldview and offered guidance to use this approach as an empirical and rigorous method similar to more quantitative methodologies. They proposed that case study approaches as research should not be equated to qualitative methods and should use a rigorous design to connect research questions through analysis to empirical results (Yin, 2002). While Yin discussed the holistic nature of case study and the inability to clearly separate the phenomenon of interest with the context, their definition of a holistic design is not all-encompassing. Yin’s (2002) holistic “single-case” design situates one “critical” case within a particular context to test a theory, provide insight into a rare case, represent a more generalized case, or examine a single case over time within changing conditions (p. 40). Stake (1995) also used the term holistic to describe a key tenet of case study design, but their interpretation and application was described very differently as a “bounded system” that “resists reductionism or elementalism” (p. 47).

Stake (1995) argued that the stories of people and places formed the “cases of interest in education and social sciences” as part of an integrated system with clear boundaries (p. 1). Specifically, these stories described how learning about the similarities and differences in these
cases of people and places helps us understand the individual and the connection to others (Stake, 1995). Stake (1995) outlined three types of case studies: intrinsic, instrumental, and collective. Researchers seeking a single case design choose between the intrinsic and instrumental designs depending on their research purpose, selecting an intrinsic design when understanding the case itself is of the primary importance while relying on an instrumental design when they plan to use the case to connect to an external application (Stake, 1995).

According to Stake (1995), researchers using case study attempt to interpret the meanings behind observational data to develop assertions based on “understandings deep within us” (p.12). Case study researchers engage in reflective practice and maintain an open mind to form high-quality assertions from the data (Stake, 1995). Stake (1995) discussed the ongoing need for researchers to prepare for data collection with a strong organizational plan, but also to remain alert for unforeseen information. Stake (1995) recommended that case researchers look at aggregate data for a broad view, and also at individual minutiae for a thorough understanding of the case during data analysis. The qualitative researcher switches between narrow and wide perspectives in the search for patterns to make meaning from the case.

Although Yin (2002) and Merriam (1998) also offered case study approaches, their structure and theories did not resonate with the intent of this particular study. While Yin (2002) has discussed the merits of case study for determining the “how” and “why” in evaluating programs, their approach lacks the flexibility researchers need to observe with an open and curious mind for students’ voice to emerge (Yazan, 2015). Similarly, while Merriam (1998) provides a more moderate approach, it lacks the emphasis of Stake’s (1995) defining characteristics of case study as holistic, empirical, interpretative, and empathic that are essential to this study (Yazan, 2015).
Ultimately, I decided that Stake’s epistemology meshed with the theoretical framework for this research as a holistic and naturalistic study from a constructivist viewpoint (Stake, 1995; Yazan, 2015). As Stake discussed the importance of case selection in intrinsic design, I identified students within specific stress levels as the case unit of analysis. The case of students with initial high perceived stress were part of the bounded system and could not be removed from the course or the context to stand alone (Stake, 1995). Stake (1995) noted, “Qualitative researchers treat the uniqueness of the individual cases and contexts as important to understanding. Particularization is an important aim, coming to know the particularity of the case” (p. 39). Thus, I felt compelled to study this particular yoga curriculum because of the benefits I observed among students during a time of rapidly declining mental health, and Stake’s foundational philosophy of case study resonated with my intention. Next, I will describe the participants and setting for both phases of this mixed methods study.

**Participants**

I chose to focus on college students as the participants for this study for several reasons. While I work with many of these students daily in my position as adjunct faculty, they are much more than a convenient group to use as a sample. Traditional-age college students face a unique set of challenges under normal circumstances, and they are suffering greatly under the added weight of the coronavirus pandemic restrictions. Yoga may offer a path for managing stress and promoting wellbeing for this group. Thus, the students enrolled in an introductory, semester-long yoga course with a comprehensive curriculum comprised an appropriate sample for this research.

As young adults struggling to find meaning in life and a sense of purposeful independence, they must also deal with new uncertainties while forging their identity and career path. College students have also confronted the adult issues related to illness, death, and grieving
for themselves and their friends and family during the past two years. They are not helpless or dependent as some may view the current generation, but rather overwhelmed and stressed to the breaking point. Prior to the pandemic, I observed how these young adults found meaning and ways to not only cope but thrive through yoga and contemplative practice.

**Population and Sample**

I selected this specific group of undergraduate students who were enrolled in a three-credit, semester long Yoga 1 course at a mid-Atlantic higher education institution. The university has approximately 14,000 undergraduate students with approximately 40% male and 60% female students (Mid-Atlantic University, 2020). The student body race/ethnicity demographics at the predominantly white Mid-Atlantic Higher Education Institution are 74% Caucasian, 11% African American, 6.2% Hispanic, 3.6% Multiracial, and 2.5% Asian (Mid-Atlantic University, 2020). Additionally, 1.9% are unspecified, and less than 1% each identify as Non-resident Alien, Hawaiian/Pacific Islander, and Native American (Mid-Atlantic University, 2020).

The students enrolled in the semester-long yoga course as a physical education elective, and 273 students were enrolled in 8 sections across 3 instructors at the start of the Fall 2021 semester.

**Participants in Quantitative Data Collection**

All students enrolled in the Yoga 1 course were invited to participated in the study, and all participants who completed informed consent contributed to the quantitative data. I met with each section during the first week of class during the Fall 2021 semester for 5-10 minutes, read the recruitment script (Appendix B), and answered any questions. I also provided all faculty with an email containing the participant recruitment letter and we emailed this to all enrolled students in Yoga 1 as a follow up.
In the letter, I explained the study including time involved, potential risks and benefits, and protocols (Appendix C). I advised students that they would be completing a Perceived Stress Survey via Qualtrics at three time points as part of the course assignments, and that the first survey would ask for their consent to participate in the research study and include a few additional questions (Appendix D). I also explained that only students over the age of 18 would be able to participate, and that anyone under 18 years of age will be excluded from participating in the study.

Additionally, I reinforced to the students that they could choose not to participate in the study but should still complete the survey to receive one point of course credit. Their instructor and I emphasized that the students’ decision to participate (or not) in the study would not impact their course grades. I offered students in all sections the incentive of entry into a raffle for a $20 gift card for a popular, local convenience store for each survey they completed.

Participants in Qualitative Data Collection

I selected a smaller group of participants from the larger pool of students who consented on the PSS for additional qualitative analysis. I advised students during initial recruitment and consent that they might be randomly selected for additional analysis of their reflective class assignments. Based on the data analysis in the Spring 2021 pilot study, I used a sample of 32 participants for qualitative analysis of assignments. After I analyzed the first PSS data points administered during week three of the semester, I chose these 32 participants from 4 different categories of stress. I randomly selected eight students with initially high perceived stress, eight students with initially high-moderate perceived stress, eight students with initially low-moderate perceived stress, and eight students with initially low perceived stress. I identified these
participants within each stress level as a case “unit” of analysis and followed their stories across the semester.

**The Yoga Curriculum**

Yoga 1 covers a comprehensive overview of yoga history and philosophy and incorporated all dimensions of wellness. The course description from the Fall 2021 syllabus was for students to develop self-awareness and an appreciation for healthy living through the understanding and practice of yoga. The student learning outcomes for the course include demonstrating knowledge across domains of wellness, physical fitness, yoga postures and breathing, and relaxation techniques. According to the outcomes, students should also improve both mental and physical fitness as measured by stress and muscular endurance and flexibility assessments. The course also covers yoga as a philosophy and a lifestyle for sustainability and wellbeing. Additionally, students often participate in thoughtful discussions related to the debate on whether yoga is a religion and on their feelings regarding cultural appropriation of yoga in Western culture.

**The Faculty**

All three faculty members are experienced-Registered Yoga Teachers (e-RYT) which means that Yoga Alliance acknowledges their expertise and experience in the field. Additionally, two instructors are certified at the 500-hour level and as Yoga Alliance Continuing Education Providers (YACEP). The faculty are all dedicated practitioners of yoga as an eight-limbed path – they do not only practice postures but continue to study with their teachers and constantly strive to integrate yoga into daily life.
Instrumentation

I carefully selected a blend of instrumentation that would provide a valid and reliable measure of students’ psychological wellbeing and could easily be integrated into the course assignments. I replaced the textbook stress assessment with the Perceived Stress Scale (PSS) in the Spring 2021 semester, and all instructors substituted the PSS for the Fall 2021 course. In addition to the widely used PSS, I used several regular class assignments with written reflection as instrumentation in the qualitative study. The three types of assignments - initial reflections, practice journals, and final assessments – provided data for triangulation at different time points before, during, and after the perceived stress measures.

Survey

I utilized survey instrumentation because self-report questionnaires are easy to administer to a large sample for collecting data before, during, and after an intervention (Creswell & Guetterman, 2019). I followed Creswell and Guetterman’s (2019) recommendation to use an existing, validated survey with good reliability with the Perceived Stress Scale (PSS). Then I added questions specific to yoga and contemplative practice as well as demographics.

I employed the same survey that I previously tested in the pilot study with two minor revisions – I added a question on academic ranking and deleted a question on living situation that could be confusing. I entered all questions into Qualtrics web-based software, so that I could distribute the survey and collect data easily. Qualtrics internally review scored the first survey as “great”, and the only negative factor was the predicted duration of 10.5 minutes. I was unable to avoid this for the first survey as I needed to embed the informed consent document, but the second and third surveys were scored as “great” with no recommendations for changes.
Perceived Stress Scale. Cohen et al. (1983) developed the Perceived Stress Scale because stress is a frequent target of research interventions, and unmitigated stress is a precursor to anxiety and other mental (and physical) health conditions (Bamber & Schneider, 2016). The ten-question PSS asks respondents to report on their feelings of stress in the past month, such as, “In the past month, how often have you felt upset by something that happened unexpectedly?” (Cohen et al., 1983). Four of the questions are reverse coded to increase the likelihood that respondents thoroughly read the questions, and frame the questions in a positive manner such as, “In the past month, how often have you felt confident about your ability to handle your personal problems?” (Cohen et al., 1983). Each question is answered on a five-point Likert scale with a higher number indicating greater perceived stress, and the 10 questions can then be summed into a total score (Cohen et al., 1983). The sum scores can be organized into three levels of stress as high, moderate, and low categories (Cohen et al., 1983). Since the moderate stress category captures the majority of participants, I further divided this group into low-moderate and high-moderate categories for more points of comparison based on perceived stress levels.

Since every individual perceives stress differently, researchers cannot measure stressors or stressful events to gain an accurate indication of how these impact individuals (Van der Kolk, 2015). While one person may feel sad when a parent dies but continue functioning in daily life, another person may completely fall apart and sink into a deep depression (Van der Kolk, 2015). Individuals interpret and respond to stress differently based on their experiences, environment, and coping resources (Antonovsky, 1979, 1987). Thus, researchers measure perceived stress for a more accurate assessment.

Researchers have used the PSS frequently across many domains and in a variety of populations (Lee, 2012). They have found the PSS a reliable and valid tool for use with college
students (Lee, 2012). However, some researchers have noticed that students experience fluctuations in perceived stress that coincide with the demands of the college semester (Conley et al., 2015). Specifically, when researchers measure perceived stress at the beginning of the semester before an intervention and then again at the end of the semester after an intervention, perceived stress may unexpectedly increase due to external factors such as final exams, heavy workload, or pending graduation (Conley et al., 2015). In this study, I administered the PSS three times and avoided the end of the semester for a more accurate measure of changes in perceived stress.

Yoga and contemplative practice researchers have also incorporated the PSS alongside other self-report questionnaires including the Five-Facet Mindfulness Questionnaire (FFMQ) and the Self-Compassion Scale (SCS) in pretest/posttest measures (Lutz et al., 2015). I determined that stress was the most important construct to measure in this study, because the ability to handle and cope with stress is foundational for other constructs related to wellbeing such as mindfulness and self-compassion. Additionally, I only relied on the PSS for a baseline measure as self-report questionnaires do not provide the in-depth details that I was investigating in this study. I was examining stress in the particular context of a global pandemic and should also note that I became aware of new research on the COVID Stress Scale (CSS) but decided against using that questionnaire.

Taylor et al. (2020) developed a COVID Stress Scale (CSS) to capture specific trauma that many individuals are navigating during the global pandemic. On the CSS, individuals answered questions across five areas of COVID stress including fear of the virus itself, xenophobia, economic worries, vicarious trauma, and obsessive monitoring for new threats (Taylor et al., 2020). Individuals with high scores (indicating greater anxiety) in one category
were more likely to have scores in all categories which indicates an interconnected web of stress surrounding coronavirus (Taylor et al., 2020). Researchers have validated the CSS to assess for COVID trauma and this can be used to measure stress responses in future pandemics as well.

However, researchers should consider the ethics of collecting data during a disaster event that may cause further harm in the middle of chaos. Researchers have learned that some previously used methods like debriefings can actually be harmful by forcing people to relive traumatic experiences which is similar to repeated exposure from media reporting (Chan et al., 2006; Hobfoll et al., 2007). I took this into consideration and chose to use the Perceived Stress Scale for a more expansive, broad investigation of stress, and also avoided triggering COVID-related trauma by asking students for specific details regarding traumatic events as in the CSS.

**Additional Survey Questions.** Researchers should use a validated and reliable instrument whenever possible, and then they can add additional questions to gather information specific to their research problem. In this study, I used the PSS as for the majority of the survey and then added questions to obtain information on participants’ demographic profile and how frequently they practiced yoga, meditation, and mindfulness. I only collected demographic data on the first survey but included the practice frequency questions on all three surveys.

**Demographic Questions.** I added demographic questions to the PSS so that I could collect information on students’ identities related to race, ethnicity and gender, their age category, academic ranking, and hours worked per week. I gathered these demographics to compile descriptive statistics for the group, and to analyze and compare trends within and across categories related to stress and practice frequency. I also needed this information to determine whether the participants were representative of the Yoga 1 course and the university profile.
**Practice Frequency Questions.** I incorporated three questions after the PSS for students to self-report their practice frequency. I used the same format as the preceding questions on perceived stress for continuity. I asked, “In the past month, how often have you practiced meditation (mindfulness/yoga)?”, and respondents chose between five answers of daily, 4-6 times/week, 2-3 times/week, once/week, or never. I hypothesized that practice frequency would increase from the beginning of the semester and wanted to check the correlation between perceived stress and practice frequency.

**Reflective Assignments**

As part of the Yoga 1 curriculum, students completed reflective assignments to increase their self-awareness. These assignments included an initial reflection, practice journals, and a final reflection and all have open-ended questions as prompts. Students have frequently shared deeper insights into how yoga has helped them within these assignments, and I recognized the value of their perspectives as qualitative data for this study.

**Initial Reflection.** Students completed an initial reflection during the second week of the semester to provide the instructor with a basic understanding of why students are interested in the course and what they already know about yoga (Appendix E). The assignment is posted on the Learning Management System (LMS) for the course and contains the following open-ended questions:

1. What are some of the reasons that motivated you to sign up for Yoga 1?
2. What do you already know about yoga?
3. What are your intentions and goals for yoga class this semester?
4. What is your experience of yoga during the first week of class?
Students have shared a wide range of intentions and existing knowledge on this simple assignment, and their first week experiences provide a glimpse of their initial perceptions of the course. The initial reflection was a low-stakes two-point assignment (out of 100 points) and graded only for completion and not on content or quality.

**Practice Journals.** Students tracked their feelings on class days in their journals by noting how they felt at the beginning of class, what their intention for practice was that day, and then how they felt after practice. Instructors offered flexibility for students to journal in the designated section of the textbook or in a separate notebook. Students uploaded pictures or typed copies of their journals each week starting in week 2 and ending in week 14 of the semester. Students typically provide a range of response lengths for their journals and there is no minimum requirement. The journals were worth 1 point each week for a total of 13 points (out of 100 points).

**Final Reflection.** Yoga 1 students completed a five-point final reflection composed of 13 open-ended questions (Appendix F). The reflection included questions on what aspects of yoga students practiced in daily life, what changes they experienced in wellness, and what they liked best about the course. Some of the questions cover a similar topic, but with different phrasing that can inspire new responses. For example, students were asked “what did you enjoy learning about in Yoga?” and then later asked “what do you feel was the most beneficial aspect of this class for you?” The slight variations in question wording often prompted students to share additional details. The final reflection was only graded based on completion, and students were asked to answer each question with at least three sentences.
Procedures

Next, I will describe the procedures that I followed in the mixed methods study. Prior to collecting data, I obtained IRB approval, gained consensus from Yoga 1 faculty on the methods, and recruited participants. Additionally, I developed a schedule for data collection and analysis, and integration of the quantitative and qualitative findings. The overall process is depicted visually in the implementation matrix (Figure 3.2).
## Figure 3.2

**Implementation Matrix**

<table>
<thead>
<tr>
<th>Timing</th>
<th>Procedure</th>
<th>Data - Quant</th>
<th>Data -Qual</th>
<th>Integration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prior to Fall Semester</td>
<td>IRB approval</td>
<td></td>
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<tr>
<td></td>
<td>Faculty training</td>
<td></td>
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<tr>
<td>Fall Semester</td>
<td>Proceed to Recruitment</td>
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<tr>
<td>Weeks 1-2</td>
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<td></td>
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<tr>
<td>Semester Week 3</td>
<td>Administer Informed Consent via Qualtrics with</td>
<td></td>
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<tr>
<td></td>
<td>PSS #1</td>
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<td></td>
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<tr>
<td></td>
<td>Administer PSS #1 via Qualtrics + Reminder</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Semester Weeks 4-6</td>
<td>Qualitative Case selection from PSS 1</td>
<td>SPSS analysis of PSS #1</td>
<td>Review initial reflection and</td>
<td>Integrate quan and qual results</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>journals weeks 2-6 and code themes</td>
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</tr>
<tr>
<td>Semester Week 7</td>
<td>Administer PSS #2 via Qualtrics + Reminder</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Semester Weeks 8-10</td>
<td>SPSS analysis of PSS #2</td>
<td>Review/code journals weeks 7-10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Semester Week 11</td>
<td>Administer PSS #3 via Qualtrics + Reminder</td>
<td></td>
<td></td>
<td>Integrate quan and qual results</td>
</tr>
<tr>
<td>Semester Weeks 12-14</td>
<td>SPSS analysis of PSS #3 and overall changes in</td>
<td></td>
<td></td>
<td>Integrate quan and qual results</td>
</tr>
<tr>
<td></td>
<td>stress</td>
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<tr>
<td>Semester Weeks 15-16</td>
<td></td>
<td></td>
<td></td>
<td>Integrate results and compare cases</td>
</tr>
<tr>
<td>Post semester</td>
<td>Finish analysis</td>
<td>Report results</td>
<td>Final Reflection thematic analysis</td>
<td>Convergence</td>
</tr>
<tr>
<td>Weeks 1-2</td>
<td>Write up results</td>
<td>Tables</td>
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</tbody>
</table>

*Note.* This implementation matrix details the step-by-step process of data collection, analysis, and integration for the research study across the Fall 2021 semester.
Data Collection and Analysis

I have detailed the data collection and analysis according to the first quantitative phase, the second qualitative phase, and then the integration of results. While I collected the quantitative perceived stress data at clear time points of weeks 3, 7, and 11, the participants’ qualitative reflective work was submitted in a steady flow from week 3 through week 15.

Phase 1 (Quantitative)

In the first phase, I gathered data to answer the research question *to what extent does perceived stress among college students decrease during a semester-long yoga course*. The Yoga instructors distributed the modified PSS with additional questions on frequency of contemplative practice and demographics to all enrolled students via Qualtrics during the third week of the semester. Each instructor displayed several printed copies of Qualtrics QR code at the end of class at the beginning of week three. After this quantitative survey data was collected in Qualtrics, I downloaded the data to Excel, and cleaned and organized the data for import into SPSS.

After loading the data into SPSS, I double checked for any errors in data entry, established codes for each question and set of responses. I added a variable to create a summed score from the 10 PSS questions that could be easily compared across and within groups over the course of the semester. I established numerical codes for demographic information and practice frequency questions for evaluation of descriptive statistics. Then I made a codebook in SPSS and entered the variable labels, while also checking and correcting for missing data and entry errors before proceeding with analysis. I used the recode variables option in SPSS for the reverse coded questions, and categorized the summed scores into high, high-moderate, low-moderate, and low stress groups. Then I grouped the participants into these four levels of stress for random stratified
selection of cases for phase 2. After ensuring that the codebook and data are correct, I checked the distribution and trends of the data, completed descriptive analysis of key variables, and assessed initial reliability and validity.

I repeated the quantitative phase two more times following the administration of the modified PSS survey during weeks 7 and 11 before conducting any inferential tests. Once all three data points were collected and merged into the SPSS file, I used repeated measures ANOVA to assess changes in perceived stress and contemplative practice frequency across the semester. I also analyzed the correlation between reported practice frequency and perceived stress. I calculated the confidence intervals and effect sizes, and then reported the findings in narrative and tables. In the meantime, I began the qualitative data collection after analyzing the PSS data from week three.

**Phase 2 (Qualitative)**

After case selection based on the four levels of perceived stress for the first data point during the quantitative phase, I collected data towards the qualitative questions *In what ways do students experience changes in wellness throughout a semester long course* and *how do college students describe aspects of the course that support their wellbeing* using the Yoga 1 reflective assignments as depicted in the implementation matrix (Figure 3.2). Following the first PSS data analysis, I determined the first cycle process codes for the first reflection across the cases (n = 27) selected from the first PSS data point. I identified patterns in these initial codes. I also entered the data into a spreadsheet to organize the responses according to questions.

I utilized inductive coding techniques throughout cycles of data analysis because I was interested in the nuances of student experiences as opposed to predetermined categories for themes (Marshall & Rossman, 2016; Miles et al., 2014). I read all data from reflective
assignments and engaged in reflective memoing throughout the process. For first cycle coding of the reflective assignments, I identified process codes to capture the action and sequence of change while coding the initial reflection and student journals (Miles et al., 2014). Process coding is designed to capture active “-ing” gerunds and is often used for first cycle coding in the constant comparative method (Miles et al., 2014). The concept of process coding is a good fit for yoga and contemplative practices where there is active learning and evolution of thinking. I organized the data within each level of stress in order to look for patterns in the second cycle coding.

In the final stages of data analysis, I conducted within and cross-case analysis for participants identified in each level of high, high-moderate, low-moderate, and low stress (Miles et al., 2014). I organized important themes and participant voices in both narrative description and a visual display to explain the results clearly.

Integration of Results (Mixed Methods)

In the final phase, I answered the mixed methods question to what extent do the quantitative results on perceived stress agree/disagree with the student reflection on the benefits of yoga for psychological wellness. I integrated the findings in this explanatory sequential design by explaining the PSS results with qualitative reflective assignments, connecting the quantitative results with the qualitative research questions, and interpreting the results to help explain the survey results with information from participants who can best reflect on the survey results (Creswell & Plano Clark, 2017).

Threats to Internal and External Validity

This study did not have a control group to compare results and determine whether the yoga program itself caused reduced stress across the semester. Students may also benefit from
other courses that offer physical activity or stress management. However, the intent of this research was to examine a particular course during a specific time frame in great detail. While the control group was not feasible in this case, a comparison to other courses or a wait-listed intervention group is a good recommendation for future research.

**Researcher Bias**

My own practice of yoga predisposes my belief that yoga is helpful for stress management and overall wellbeing which can bias the study. However, my deep knowledge of yoga and how the practice works on a neurobiological level also informs my understanding of the transformative process and provides a foundation for constant comparative coding of the qualitative data. As Merriam noted, the “investigator as instrument or thick description...can be construed as either strengths or limitations lead to concerns of validity and reliability” (1985, p. 211). Stake (1995) also discussed the teacher’s obligation and responsibility to investigate intriguing classroom phenomenon more deeply. I regularly practice reflectivity and self-observation that is important for qualitative researchers within my yoga practice. Additionally, I addressed aspects of researcher bias by detailing my rationale in memos, member checking transcripts and quotes with participants, and triangulating multiple sources of data.

**Observer’s Paradox**

The participants may respond differently knowing that they are part of a research study. While I cannot completely remove this threat as a researcher, I attempted to minimize the lens of observation by analyzing assignments that were already embedded in the course. Once participants completed informed consent, the research was not discussed again during class except when the follow up PSS surveys were administered.


**External Validity - Generalizability**

This research has limited generalizability overall and in the qualitative phase, but also provides a path for future research in the field. On a broad level, I studied a very high-quality yoga course with a comprehensive curriculum, and I found only one other similar example in the literature (Villate, 2015). Other college administrators and program developers in the general population may not be able to replicate this type of programming. There is a possibility that a limited yoga program that only offers instruction of postures and breathing may offer enough benefits to students. However, students did have significant reductions in stress while participating in this well-developed yoga program, and they described other aspects of the course as helpful in the qualitative phase.

The qualitative case study approach also limits the ability to generalize the results to other populations. Stake (1995) acknowledged that case study, especially a single intrinsic case, appears to inherently lack generalizability because the intention is to study a unique case in great detail. However, they also noted that this specific inquiry can produce some generalizations, and that “people can learn much that is general from a single case” (p. 85). These naturalistic generalizations rely on the researcher’s telling of the story and the reader’s interpretation based on their own experiences (Stake, 1995). While I studied a very specific case of students with moderate-high and high perceived stress enrolled in a comprehensive yoga curriculum during the context of a global pandemic, educators can increase their general understanding of what students find helpful in alleviating extreme stress.

**Protection of Human Subjects**

The Institutional Review Board approved this study #IRB-FY2021-212 on June 29, 2021. While this study did not pose any more than minimal risk to participants, I still considered
potential ethical issues and risks and planned mitigation strategies to receive Institutional Review Board (IRB) approval. On a very basic level, I needed to maintain participants’ confidentiality and anonymity by protecting their identifying details and storing data in a secure location. More specifically, I applied the Belmont Report’s three-pronged code of ethics: respect for persons, beneficence, and justice with special considerations in the Scholarship of Teaching and Learning (SoTL) within my study (Martin, 2013). I will discuss in more detail how the ethical concerns of power dynamics, traumatic triggers, disclosure of sensitive topics, and equity were critical for this study.

**Participant Privacy**

I addressed the first aim of “respect for persons” by ensuring participant privacy, maintaining freedom of choice, and securing study data. I planned steps to protect participant privacy through confidentiality and anonymity. I maintained all paper records in a locked file and stored electronic records on a password protected computer. I assigned pseudonyms and record numbers instead of using actual participant names. Additionally, this research did not contain particularly sensitive information that could cause harm to participants, but I still maintained strict protocols to protect privacy and confidentiality of participants.

**Power Dynamics**

In addition to the standard considerations of respect for persons, I also carefully considered the ethics of my dual role as instructor/researcher. Since I taught 3/8 sections of Yoga I, the students in my sections may have felt coerced into participating in the study to gain favor or receive a better grade (Martin, 2013). First, I ensured that there was no impact to any students’ grades based on participation in this study. This clause was important as other instructors have offered extra credit to participants in previous research conducted by external faculty. This lack
of incentive may have reduced student motivation to participate but it was important that no student receive any grade bonus for participation. I provided an alternate incentive of a gift card raffle to motivate students to complete the Perceived Stress Scale that was also a class assignment. Even though I have clearly stated in the informed consents that students would receive no grade impact by choosing to participate (or not) in the study, students in the Yoga 1 sections that I teach may still have felt compelled to participate for approval.

Secondly, I did consider eliminating students within my sections from the smaller qualitative sample. I still had several sections to pull from for the qualitative sample and did not have a teacher/student relationship with the smaller group. However, I decided during the pilot study that the students did not seem to acknowledge the ongoing research either way after deciding whether they would participate in the study. The students were all invited to participate at the beginning of the semester before they had any knowledge of me as a teacher, so they did not seem to feel any reason to participate for my benefit or approval (Martin, 2013).

Finally, I minimized any feelings of coercion by clearly stating the research methods in my recruitment script and informed consent letters. I explained to students that I would remove their names from all data and assignments before analyzing the information. I ensured that students understood that they would only be graded based on completing the assignment and not based on exceeding the requirements or allowing their work to be used as data. There was still a possibility that students agreed to participate and then felt uncomfortable later, and I assured participants know that they could stop participating at any time.

**Traumatic Triggers**

I worked to minimize any potential harm and maximize the benefits applying the guideline of beneficence for all participants enrolled in the study. There was always a small risk
that reflective work could trigger past trauma, and I referred any participants to campus resources per the standard protocol within the course. I am certified in Mental Health First Aid so that I could identify warning signs of distress and was ready to reach out to participants immediately. All students in Yoga 1 are already at risk of confronting trauma, but they are also learning how to cope with past trauma as it resurfaces.

Participants in this study did not receive any direct benefit, but they appreciated participating in the research process on this important topic. Students who chose to participate may have taken the class more seriously with the understanding that they were contributing to field of research on yoga. Students did cover the research on yoga as part of the Yoga 1 curriculum and may benefit from seeing that research take place within the classroom (Martin, 2013). Overall, the risks were minimal given that most study components were part of an existing class. The main benefit was the potential contribution of new literature on the ways that yoga can reduce stress and improve wellbeing of college students.

**Disclosure of Sensitive Topics**

Yoga 1 students occasionally disclose sensitive topics in their reflective work, and I maintained clear boundaries and informed participants that I am a mandated reporter. I prioritized my job to keep students safe over my role as a researcher collecting information. I was extra cautious since some of the students were participants in this study, but I was already aware of this balance even within the context of Yoga 1 solely as a class.

**Equity**

I carefully considered the third prong of the Belmont Report, justice, as a critical ethical issue. I conducted this research to benefit college students, and especially those students who identify within marginalized groups based on race, gender, gender identity, sexual orientation,
ability. Yoga is predominantly practiced by thin, white, educated females in the United States with significantly lower participation among racial and ethnic minorities (Cramer et al., 2016). The Yoga 1 course sections are generally much more diverse than typically seen in yoga research, and I hoped to capture that diversity.

However, I was concerned that the students with the highest needs might have been the least likely to participate. I know that all Yoga 1 faculty did their best to create a classroom climate that is accessible, welcoming, and culturally responsive; but I was concerned that students with identities different from the instructors would be less likely to enroll in the study. Researchers have noted many barriers to mind-body health for marginalized groups including access, cost, time, lack of authentic teachers, and misunderstanding of yoga and mindfulness (Spadola et al., 2017). The Yoga 1 course does remove some barriers related to time, access, and cost and may offer an ideal environment for many students. Researchers have identified the lack of diverse representation as a good opportunity for future research (Spadola et al., 2017).

**Limitations of Explanatory Sequential Mixed Methods Design**

I considered several common validity threats and limitations specific to an explanatory sequential mixed methods design. These threats included a lack of detail on the important quantitative findings, inadequate or missing explanation of differences between the quantitative and qualitative results, and a disconnect between the first phase quantitative analysis and the second phase qualitative results (Creswell & Plano Clark, 2017). I conducted a thorough evaluation of the quantitative results and underlying variables. I investigated unexpected and divergent quantitative results during the qualitative data collection (Creswell & Plano Clark,
2017). Additionally, I selected the qualitative sample purposefully to best explain the connection between the quantitative and qualitative phases (Creswell & Plano Clark, 2017).

I also remained aware of additional threats for a case study design if there is a lack of defined bounds for the case(s), a lack of rationale for selection of cases, or a lack of cross comparison when multiple cases are identified (Creswell & Plano Clark, 2017). I attempted to mitigate these design specific validity threats by careful attention to the common pitfalls, and through diagramming of the study design including potential threats (Creswell & Plano Clark, 2017).

**Summary**

In this chapter, I described the research design for this study, the rationale for the explanatory sequential mixed methods design, and the background for use of survey design with a case study approach. I explained the methodology in detail including the participants, data collection and analysis, the integration of results, and limitations and ethical considerations. In the next chapter, I will discuss the results of the study.
Chapter IV: Results

Researchers have been investigating yoga as a practice for physical and mental wellbeing for decades, and this holistic path for maintaining health has become more relevant in the context of the current global pandemic. When I conducted a pilot study on two semester-long yoga courses during Spring 2021 virtual instruction (discussed in detail in Chapter I), participants experienced a rapid and significant reduction in perceived stress and described immense benefits from their contemplative practice in all areas of life. During these remote classes, students noted that they felt very comfortable practicing yoga in their own space and yoga classes were well attended. Participants also acknowledged the downside of missing the sense of community (with other students) and more detailed feedback from the instructor on their form and alignment. The virtual instruction provided a distinct context for students’ experiences in the yoga course that informed the current research, but the return to campus presented a new set of challenges with differing results in students’ perceived stress and reflections.

Comparison of the Pilot Study to Fall 2021

The pilot study may have informed the methods for the current work, but there were clear differences in perceived stress across both studies. During the Spring 2021 semester, participants’ (n = 40) mean perceived stress significantly decreased between week 3 (M = 20.78) week 7 (M = 17.90), and then decreased slightly again (M = 17.38) at week 11. Qualitatively, participants shared the importance of yoga as a practice for clearing the mind to manage stress, maintaining self-care, and learning tools for dealing with crisis in daily life.

In comparison, the participants in the Fall 2021 study exhibited a different pattern with continued higher mean perceived stress levels. While the pilot study participants reported statistically significant reduced perceived stress between week 3 and week 7, the Fall 2021
participants only experienced a slight decrease in perceived stress between the same data points. Then, between weeks 7 and 11, the pilot study sample recorded a slight, non-significant continued decrease in perceived stress while the Fall 2021 sample had a statistically significant reduction. This difference may demonstrate that a different “dose” is needed in a yoga prescription based on environmental conditions and current events.

The trajectory of perceived stress was clearly different in the remote instruction setting as compared to a return to person. As educators and students quickly learned, the shift from remote learning to in-person instruction was not a return to normal but presented a new set of challenges as the coronavirus pandemic continued to upset normal routines.

**Return to Campus: Fall 2021**

The American College Health Association (ACHA) predicted that colleges returning to campus in Fall 2021 would face even greater struggles than previously experienced in early pandemic education because of masking policies, social distancing, surges in the virus and variants, and a myriad of limited resource and supply chain issues (2021). The semester was marked by constant fluctuations in attendance resulting from ongoing physical and mental health concerns. In this study, the in-person yoga classes could not use the typical environment because the space was too small to allow for distance, and the temporary space was open to interruptions and without climate control. Instructors were challenged by an inability to maintain the safe and cozy space that many students had enjoyed while learning in their own homes during virtual instruction. Student participants frequently discussed the wide range of challenges returning to in-person instruction during the continued public health crisis, and their constant struggle to stay physically and mentally healthy despite chronic high perceived stress. As students experienced high levels of perceived stress, yoga courses provided one method of managing stress and
sustaining wellbeing. In this chapter, I will share how students rated their perceived stress and described the impact of yoga on their overall health and wellness across the semester.

In this study, I investigated how students experienced changes in wellness while enrolled in a semester-long yoga course within the context of returning to in-person instruction. I implemented a mixed methods explanatory sequential design which first quantitatively analyzed changes in participants’ perceived stress and then used a qualitative lens to more deeply examine how students described the role of contemplative practice on their stress management and wellbeing. First, I will discuss the quantitative results on participants’ changes in perceived stress throughout the semester.

**Changes in Perceived Stress and Contemplative Practice**

While participant reports of perceived stress provided a limited perspective of students’ wellbeing across the semester, this measure offered initial data on the fluctuation of stress levels in the context of returning to in-person instruction. Additionally, participants answered questions on their practice frequency of yoga, meditation, and mindfulness on each survey. I combined these three questions into a summed scale of contemplative practice frequency to assess the correlation between perceived stress and practice throughout the semester.

**Participant Recruitment and Demographics**

Prior to collecting demographic information from participants, I explained the research study, obtained informed consent, and excluded data from students who did not consent, were under 18 years of age, or who had taken the yoga I course previously. All 273 students enrolled in the yoga course across three instructors teaching eight total course sections were asked to complete the modified perceived stress survey as part of class assignments.
In the first survey, I asked students to answer questions regarding demographics (6), perceived stress (10), and practice frequency for yoga, meditation, and mindfulness (3). On the first administration of the PSS, 230 students (85%) responded to the survey, and 172 students (75%) consented to participate in the study. Out of the 172 initial participants, 30% did not complete the full PSS for one or both of the follow up data points. These participants were excluded from both quantitative and qualitative analysis for a final sample of n = 121 (Figure 4.1).

**Figure 4.1**

*Participant Attrition Diagram*

<table>
<thead>
<tr>
<th>Initial Consent</th>
<th>n = 172</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSS 1</td>
<td></td>
</tr>
<tr>
<td>Qualitative Sample</td>
<td>n = 32</td>
</tr>
<tr>
<td>(n = 4 per stress level: low, low-moderate, high-moderate, high)</td>
<td></td>
</tr>
<tr>
<td>Quantitative Sample</td>
<td>n = 172</td>
</tr>
<tr>
<td>PSS 2 and 3</td>
<td></td>
</tr>
<tr>
<td>Qualitative Sample</td>
<td>n = 27</td>
</tr>
<tr>
<td>Participants (n = 5) excluded who did not complete all PSS</td>
<td></td>
</tr>
<tr>
<td>Quantitative Sample</td>
<td>n = 121</td>
</tr>
</tbody>
</table>

*Note.* This diagram depicts the loss of participants who missed either PSS 2 or PSS 3 and were then excluded from the qualitative analysis.

I conducted a missing data analysis to analyze the differences between the initial group (n = 172) and the final sample (n = 121). I reviewed descriptive statistics for the sample and analyzed for
differences based on gender, race/ethnicity, academic rank, and weekly work hours for the participants who initially consented (n = 172) and for those who completed all three PSS surveys (n =121) (see Table 4.1).
### Table 4.1

**Sociodemographic Characteristics and Perceived Stress of Participants at Initial Survey**

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Full Sample PSS 1</th>
<th>ANOVA Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n = 172, M = 20.59 (6.33)</td>
<td>n = 121, M = 19.74 (6.26)</td>
</tr>
<tr>
<td>Gender Identity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>120</td>
<td>84</td>
</tr>
<tr>
<td></td>
<td>69.8 (6.27)</td>
<td>30.6 (5.66)</td>
</tr>
<tr>
<td>Male</td>
<td>52</td>
<td>37</td>
</tr>
<tr>
<td></td>
<td>30.2 (5.90)</td>
<td>69.4 (5.76)</td>
</tr>
<tr>
<td>Race Identity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>141</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>82.0 (6.50)</td>
<td>82.6 (6.20)</td>
</tr>
<tr>
<td>Black/African American</td>
<td>22</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>12.8 (5.14)</td>
<td>11.6 (5.27)</td>
</tr>
<tr>
<td>Asian</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>3.5 ***</td>
<td>4.1 ***</td>
</tr>
<tr>
<td>American Indian/Alaskan Native</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>1.2 ***</td>
<td>.8 ***</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18–24</td>
<td>168</td>
<td>118</td>
</tr>
<tr>
<td></td>
<td>97.7 (6.27)</td>
<td>97.5 (6.11)</td>
</tr>
<tr>
<td>25–34+</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>2.3 (6.55)</td>
<td>2.5 (4.36)</td>
</tr>
<tr>
<td>Academic Rank</td>
<td></td>
<td></td>
</tr>
<tr>
<td>First Year/Sophomore</td>
<td>15</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>8.7 (6.07)</td>
<td>5.0 (5.00)</td>
</tr>
<tr>
<td>Junior/Senior</td>
<td>157</td>
<td>115</td>
</tr>
<tr>
<td></td>
<td>91.3 (6.37)</td>
<td>95.0 (6.16)</td>
</tr>
<tr>
<td>Work Hours/Week</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-10</td>
<td>62</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>36.0 (6.14)</td>
<td>37.2 (6.48)</td>
</tr>
<tr>
<td>11-20</td>
<td>59</td>
<td>43</td>
</tr>
<tr>
<td></td>
<td>34.3 (5.84)</td>
<td>35.5 (5.78)</td>
</tr>
<tr>
<td>21-30</td>
<td>34</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>19.8 (6.12)</td>
<td>19.8 (5.75)</td>
</tr>
<tr>
<td>31-40+</td>
<td>17</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>9.9 (6.86)</td>
<td>7.4 (6.30)</td>
</tr>
</tbody>
</table>

*Note:* This table provides detailed demographic and background characteristics of participants and their initial perceived stress with comparison of all students who initially consented and those who completed all three perceived stress surveys for ANOVA analysis.

***Data removed to protect identity***
Participants self-selected their gender and racial identity from a variety of options and also had the option to write in a description. The demographic background of participants for this study was more diverse than the typical participant profile in previous yoga research of young, white females (Cramer et al., 2016). Although more females (69.4%) than males (30.6%) did complete the study, that was expected since females are more likely to practice yoga (Cramer et al., 2016). The ratio of females to males was still comparable to the overall university demographic of approximately 60% female students and 40% male students (Mid-Atlantic University, 2020). The racial identity of participants was also very similar to the student population at this predominantly white university (Mid-Atlantic University, 2020). While the sample is not representative of diversity in the national population, the participants were representative of the university profile and much more diverse than typical yoga practitioners or samples in past contemplative research (Cramer et al., 2016). The diverse demographic background provided an opportunity to observe differences in initial perceived stress during week 3 of the semester (Table 4.1).

Although the perceived stress scores cannot be analyzed for statistical differences because of unequal sample sizes, participants demonstrated some observable differences in perceived stress according to sociodemographic characteristics. One of the most notable differences was the higher perceived stress among self-identified females (M = 21.13) as compared to males (M = 16.22). Graves et al. (2021) recently confirmed this gender difference in perceived stress among college students and suggested that more academic programming is needed to teach coping skills regardless of gender. In this study, participant demographics that demonstrated greater stress included low-incidence race/ethnicity identities, older students, those who worked more than 30 weekly hours, and freshman/sophomore students. Additionally, there
were some small, but visible differences between students who completed all three surveys as compared to participants who only completed one or two of the surveys.

**Response Rate and Attrition**

Although there was a high initial consent rate and a solid overall completion rate for a repeated survey design, 30% of participants did not complete all three surveys necessary for repeated measures ANOVA analysis. The response rate was well over the 50% threshold that is considered excellent and acceptable for journal publication (Creswell & Guetterman, 2019). Since this is classroom-based research, there are several factors that contribute to the loss of participants outside of typical attrition in experimental study designs. First, I needed to match participant data from the first PSS survey to the second and third surveys, and four students failed to include their last name or used their initials on the follow up surveys and could not be accurately identified. I discarded those results to ensure accuracy. Second, not all students complete a full semester in any course, and seven participants withdrew either from the course or from the university before completing all three surveys.

Additionally, since there were multiple instructors, I was not able to control follow up practices across the various class sections. I observed that two instructors had similar attrition rates of 15%, but a third instructor had a much higher attrition rate of 58% so there may have been differences in survey administration that impacted completion of the follow-up surveys. However, while this instructor’s students reported statistically significant higher initial perceived stress at week 3 as compared to other instructors, the students still experienced statistically significant reductions across the semester.

Overall, the response was robust given the difficulties of returning to in-person instruction during this challenging time. Since the surveys were class assignments and time
sensitive, there was a small window of time for completion with limited ability of the researcher
to remind students to complete the surveys. If students were absent for illness, they could not
make up the survey without instructor permission. While there was a 30% attrition rate overall,
the percentage of students who completed all three survey points is high given that low response
rate is a known barrier in survey design, but there was still potential for response bias (Creswell
& Guetterman, 2019).

In considering response bias, I needed to analyze for differences between the participants
who responded to all three surveys versus those who did not complete one or both of the follow-
up surveys. Those who completed all three surveys (n = 121) had slightly lower mean perceived
stress (M = 19.74) than the full sample including participants who missed one or both follow-up
surveys (n = 172, M = 20.59) as depicted in Table 4.1. When I compared the initial PSS mean of
the participants who completed all three surveys (n = 121) versus those who missed one or both
follow up surveys (n = 51, M = 22.61) using a one sample t-test, there was a statistically
significant higher (p = .001) initial PSS for the groups who did not complete follow up surveys.
The average perceived stress of the students who did not complete all three surveys was
approximately 2.86 higher than the students who completed all PSS measures. This difference
should be interpreted with caution given the difference in sample sizes and use of the n = 121
sample mean as a population test value, but there are logical reasons for attrition of students with
higher perceived stress.

Participants with high initial perceived stress may face greater barriers within the college
environment or their home life. One possible reason for this difference is that some participants
with higher perceived stress and a greater workload may have had less time to prioritize a low-
stakes assignment or struggled to complete assignments in general. Some participants did
withdraw from the course, and several expressed that emergency family or financial situations limited their ability to attend classes. While response bias is always a possibility, the participants who completed all three surveys and reflective assignments benefitted from the yoga course and learned tools to manage stress during the historically significant time of a global pandemic.

Future researchers can take additional steps to mitigate the potential for response bias by ensuring that all class sections allow enough class time to complete stress assessments and that instructors follow up with students who are absent from class during the assessments.

Changes in Perceived Stress During the Semester

Participants in the Fall 2021 study answered ten questions to rate their perceived stress at three points during the semester to assess changes. Participants (n = 121) reported scores on the Perceived Stress Scale at Week 3 (M = 19.74, SD = 6.26), Week 7 (M = 19.52, SD = 5.94), and Week 11 (M = 18.29, SD = 5.90) of the semester-long yoga course. The means and standard deviations are presented in Table 4.2.

Table 4.2

Descriptive Statistics for Perceived Stress Scores Across the Semester

<table>
<thead>
<tr>
<th>Week</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>19.74</td>
<td>6.26</td>
</tr>
<tr>
<td>7</td>
<td>19.52</td>
<td>5.94</td>
</tr>
<tr>
<td>11</td>
<td>18.31</td>
<td>5.90</td>
</tr>
</tbody>
</table>

Note. n = 121 for all data points
The mean perceived stress decreased across each time point, first at a non-statistically significant level \((p = 1.0)\) between week 3 and week 7 and then a statistically significant decrease \((p = .03)\) between weeks 7 and 11. The overall decrease from week 3 to week 11 was also statistically significant \((p = .01)\). While the participants decreased perceived stress scores provided one measure of change during the semester, they also reported the frequency of their contemplative practices of yoga, meditation, and mindfulness on each survey for additional comparison of changes.

**Changes in Contemplative Practice Frequency**

On each survey, participants rated how frequently they completed each practice on a 0 (never) - 4 (daily) scale, and I combined the three scales into a summed contemplative practice scale \((0 – 12)\). Participants’ mean scores increased statistically significantly \((p = .000)\) from week 3 (2.92) to week 7 (5.52) with a non-statistically significant increase \((p = .407)\) between week 7 and week 11 (5.71) (see Table 4.3). The overall increase from week 3 to week 11 was also statistically significant \((p = .000)\).

**Table 4.3**

*Descriptive Statistics for Contemplative Practice Frequency Across the Semester*

<table>
<thead>
<tr>
<th>Week</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>2.92</td>
<td>2.57</td>
</tr>
<tr>
<td>7</td>
<td>5.52</td>
<td>1.91</td>
</tr>
<tr>
<td>11</td>
<td>5.71</td>
<td>1.92</td>
</tr>
</tbody>
</table>

*Note. n = 121 for all data points*
Participants completed the first survey during the third week of the semester as they were just beginning their contemplative practices. As the semester progressed, students completed more in-class practices and increased their mindfulness, meditation, and yoga outside of class time. While increases in participants’ contemplative practice frequency may not have caused the decrease in perceived stress, these baseline measures provided a comparison variable for changes in perceived stress during analysis with a repeated measures ANOVA.

**Analyzing Changes in Perceived Stress and Contemplative Practice**

I used a repeated measures ANOVA to analyze the separate variables of perceived stress and contemplative practice frequency at three points across the semester. Researchers use the repeated measures ANOVA to check for differences in the same group of people across different time points. The repeated measures ANOVA analysis cannot determine whether a particular intervention caused the change in a variable of interest but demonstrates if the variable changed during the intervention time at a significant level. In this analysis of perceived stress scores across the semester, there was a significant effect for time, Wilks’ Lambda = .92, $F(2, 119) = 5.02, p < .01$, multivariate partial eta squared = .078 (see Table 4.4). The partial eta squared of .08 indicates a medium effect size with 8% of the dependent variable (perceived stress) explained by the independent variable of time in the Yoga 1 course (Pallant, 2020). This result indicated that perceived stress scores decreased at statistically significant levels across the three time points with a medium effect during the semester-long yoga course.
Table 4.4

One-Way Repeated Measures Analysis of Variance Comparing Perceived Stress Across Three Time Points

<table>
<thead>
<tr>
<th>Variable</th>
<th>Week 3</th>
<th>Week 7</th>
<th>Week 11</th>
<th>df</th>
<th>F</th>
<th>P</th>
<th>$n^2p$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived Stress</td>
<td>19.74</td>
<td>6.26</td>
<td>19.52</td>
<td>5.94</td>
<td>18.31</td>
<td>5.9</td>
<td>2.119</td>
</tr>
<tr>
<td>Contemplative Practice Frequency</td>
<td>2.92</td>
<td>2.57</td>
<td>5.52</td>
<td>1.911</td>
<td>5.71</td>
<td>1.92</td>
<td>2.119</td>
</tr>
</tbody>
</table>

\(^a\) n = 121 for all data

Note: This table shows the changes in mean perceived stress scores and contemplative practice frequency across three data points.

Additionally, researchers only use the repeated measures ANOVA itself to analyze for differences across the time points, and post hoc testing must be used to determine the change between each time point. I applied Bonferroni post hoc testing to explore differences between each of the three time points (week 3, week 7, and week 11). Participants’ mean perceived stress scores decreased at a non-statistically significant level between the week 3 and week 7 data point ($p = 1.00$), and then exhibited a statistically significant decrease from week 7 and week 11 ($p = .03$) and also between week 3 and week 11 ($p = .01$).

While the group mean perceived stress decreased at a statistically significant level across the semester, the individual changes in perceived stress levels are not visible at that level and are also important. I examined the pattern of individual changes in perceived stress according to levels (low = 0-13, low-moderate = 14-20, high-moderate = 21-26, high = 27-40) across the three data points (See figure 4.2).
Figure 4.2

*Graphical Representation of Individual Changes in Perceived Stress Grouped by Initial Level*

Note. This figure provides a visual model of how perceived stress scores changed for individual participants as grouped by initial perceived stress levels.

A primary objective for the introductory yoga course is that students develop a self-practice that is sustainable and integrated into daily life after the course ends. The changes in contemplative practice frequency are also represented in Table 4.4. Participants reported changes across all three areas and the summed scale with a statistically significant increase between weeks 3 and 7, and a non-significant continued increase from week 7 to week 11. In the analysis of contemplative practice frequency across the semester, there was a significant effect for time, Wilks’ Lambda = .92, $F(2, 119) = 93.1, p < .01$, multivariate partial eta squared = .61. This result can be interpreted as a significant increase in contemplative practice frequency with a very large effect size (Pallant, 2020). Simply put, participants practiced yoga, meditation, and mindfulness at a greater frequency in weeks seven and eleven as compared to week three. These changes in perceived stress and contemplative practice frequency were unsurprising, yet an important foundation for further explanation in the qualitative phase.

**Selecting the Qualitative Sample**

The quantitative data on perceived stress and contemplative practice frequency offered baseline measurements and sample selection guidelines for the second qualitative phase of the...
study. I selected students for the qualitative sample using the stress levels in the first survey and used a random number generator to identify eight students from each of the following stress level groups (total n = 32): high perceived stress, high-moderate perceived stress, low-moderate perceived stress, and low perceived stress. Participants were excluded if they did not complete all three PSS surveys (n = 5), and 27 participants were included in the qualitative analysis. I began the qualitative analysis of the participants’ initial reflections in week 4 of the semester to connect this set of reflections to the initial PSS data. Then I coded their practice journals throughout the semester and organized these by the second and third PSS data points. Finally, I used the final reflections as another point of triangulation to gather more information on their retrospective experiences in the course and perspective on what supported their wellbeing. Additionally, I delved more deeply into an analysis of the perceived stress scores for the participants in the qualitative sample to connect the qualitative themes to the PSS data. Before discussing the qualitative analysis, I will present a summary of the changes in perceived stress for this smaller sample (n = 27).

**Examining Quantitative Perceived Stress in the Qualitative Sample**

When I compared the mean scores in perceived stress for the larger sample (n = 121) in the quantitative phase, I considered how individual student’s changes in perceived stress could easily be missed within the larger data. While a change in the overall mean can indicate that a semester-long yoga course may be helpful in reducing perceived stress, the group change does not illustrate the dramatic changes that individual students report. These individual changes may be even more important in understanding how yoga can help students improve their wellbeing. For the smaller qualitative sample (n = 27), I examined the participants’ movement across perceived stress groups at each data point to see how they moved from one category (low = 0-13,
low-moderate = 14-20, high-moderate = 21-26, high = 27-40) to another and in which direction (increased/decreased/stayed the same) (see Figures 4.3 – 4.6).

**Figure 4.3**

*Changes in Perceived Stress Level for Participants with Low Initial PSS*

![Graph showing changes in perceived stress level for participants with low initial PSS](image)

*Note.* This figure shows the changes in perceived stress scores for each participant in the qualitative sample with an initial low PSS (n = 7).

The seven participants who initially rated their perceived stress as low had scores ranging from 5 to 13 at the week 3 timepoint with a variety of changes across the semester. For example, Participant 84 rated their perceived stress as a 5 at all three timepoints. Participant 93 also started with a PSS of 5, but that increased dramatically to a 15 (low-moderate) and then dropped to a 7 by week 11. Participant 37 also increased into the low-moderate range for the second data point before dropping back slightly into the low stress category at week 11. Several participants (78, 84, 134, 138) experienced subtle variations in PSS scores and stayed within the low perceived stress category at all data points. Participant 103 experienced increases in PSS scores at weeks 7
and 11, moving into the low-moderate stress range. As all participants started within the lowest perceived stress there was no lower category or much room to decrease perceived stress. Participants with low-moderate initial perceived stress also experienced a variety of changes across the semester (see Figure 4.4).

**Figure 4.4**

*Changes in Perceived Stress Level for Participants with Low-Moderate Initial PSS*

*Note.* This figure shows the changes in perceived stress scores for each participant in the qualitative sample with an initial low-moderate PSS.

The participants who initially rated their perceived stress as low-moderate (14-20) had similar scores at week 3 with differing journeys throughout the semester. One participant (98) decreased significantly from a score of 19 at the week three timepoint to a low PSS of 8 at weeks 7 and 11. Four participants (99, 41, 39, 79) experienced subtler shifts across the semester and stayed within the low-moderate range throughout. Participant 109 rated a higher perceived stress score of 22 at the week 7 timepoint with a decrease to 18 by week 11. Participant 16 recorded
higher perceived stress of 25 at week 7 and 23 at week 11, which represented a sustained increase into the high-moderate category of perceived stress. Overall, participants with initial low-moderate perceived stress stayed within the 14-20 PSS range with one student decreasing by one category level and one participant increasing by one category level at week 11. Participants with high-moderate perceived stress at timepoint one reported greater variability across the semester (see Figure 4.5).

**Figure 4.5**

*Changes in Perceived Stress Level for Participants with High-Moderate Initial PSS*

![Graph showing changes in perceived stress levels for high-moderate initial PSS participants.](image)

*Note.* This figure shows the changes in perceived stress scores for each participant in the qualitative sample with an initial high-moderate PSS

Participants who started in the high-moderate stress category (n = 7) also had diverse changes in perceived stress across data points. Two participants stayed in the same category across all three time points with minimal changes. Another participant (36) experienced an increase into high perceived stress at the week 11 data point, and then decreased back into the high-moderate level by week 11. Four students reported an overall decrease in perceived stress
(94, 74, 12, 170) including one participant (94) who scored their perceived stress in the low category at the week 11 datapoint. Data from the participants with the highest initial perceived stress was also varied, and I will explain those results next (see Figure 4.6).

**Figure 4.6**

*Changes in Perceived Stress Level for Participants with High Initial PSS*

![Graph](image)

*Note.* This figure shows the changes in perceived stress scores for each participant in the qualitative sample with an initial high PSS.

The participants with the highest perceived stress (n = 6) initially all experienced a decrease in PSS scores, and all except one decreased out of the highest stress category. Additionally, one student in this qualitative sample was removed because they experienced external challenges that prevented attendance and did not complete all three PSS surveys (Participant 157, Week 10 Journals). Two participants (69, 75) reported perceived stress in the high-moderate range by the third data point at week 11. Another two participants’ (26, 105)
perceived stress decreased into the low-moderate category by week 11. One participant observed a dramatic decline into the low category with a 25-point drop in perceived stress across the three time points. While I found additional data of interest by examining the individual changes in perceived stress for the qualitative sample (n = 27), I needed to analyze their qualitative data to make connections between these scores and the ways that yoga and contemplative practice may have contributed to any changes. Next, I will share the themes from the qualitative analysis of the participants’ reflective assignments.

**Qualitative Changes in Wellness**

While participants reported lower levels of perceived stress alongside greater frequency of contemplative practice across the semester-long course, the quantitative data only offered a glimpse into “what” changed. As students documented their progress throughout the course, they shared valuable insight into “how” and “what else” yoga helped in their daily lives. The three different time points of the reflective also provided a perspective of their thoughts on yoga at the beginning, during, and at the end of the semester long-course. In the initial reflections, students set goals and shared their early perceptions of contemplative practice. Then they continuously assessed the impact of yoga in their daily practice journals. Finally, the students reflected on the semester as a whole and shared how yoga was helpful in a bigger picture. I assigned pseudonyms to all participants in the qualitative sample and used these throughout the following sections.

**Initial Reflections: Scheduling Self-care**

While participants offered many different reasons for enrolling in the yoga course – including improving mental health, stress management, and physical health – their desire for scheduled, guilt-free time for self-care was a prevailing theme across all wellness domains. One primary theme was that the “easy elective” allowed them to schedule time for self-care or to
“take a break” from their worries (Participants 4, 13, 16, 26, 79, 94, 103, 138, Initial Reflections). Some students referenced past experiences with yoga (especially during the pandemic) that they had enjoyed but were unable to maintain a consistent, serious practice (Participants 4, 36, 41, 74, 79, 94, 98, 134, Initial Reflections). They were motivated to register for the course and have a set time in the day for contemplative practice – either as a place to escape for a bit or somewhere to learn how to better cope with daily life (Participants 4, 13, 16, 26, 36, 41, 74, 79, 94, 98, 103, 134, Initial Reflections).

**Pandemic Practice Online.** A few students enrolled in yoga specifically because they had started practicing online during quarantine to remediate the stress of the ongoing pandemic (Participants 69, 78, 98, 152) including Sally (13), a participant with high perceived stress at the beginning of the semester, who noted:

> Over the rough few semesters online, I struggled a lot with mental health problems. It was very hard to get out of bed some days and it got to the point where my roommate offered one of her yoga mats to me to do some simple beginner practice with her. I started practicing with her more and more and I really enjoyed it. It was a no-brainer to sign up for Yoga I this semester. (Initial Reflection)

Much like Sally, 12 additional participants from the qualitative sample expressed in their initial reflections that they had tried yoga before, most had only taken a few in-person classes or followed YouTube videos but had not had any comprehensive education on the moral and ethical precepts, meditation, mindfulness, and breathwork (Participants 4, 12, 13, 36, 37, 69, 74, 75, 78, 79, 94, 98, Initial Reflections). Only one senior student, Lisa (93), noted that she had taken a formal yoga course in high school but expressed that she had matured since and would benefit much more during this class (Initial Reflection).
**Escape Versus Active Coping.** While some participants opted for the yoga course as a temporary escape to forget about the stress of daily life (Participants 16, 58, 69, 138, Initial Reflections), others enrolled to learn new skills to actively cope with their stressors in daily life (Participants 4, 13, 41, 58, 75, 99, 152). While the concepts of escape versus active coping seem somewhat contradictory, both are important and can occur in conjunction with each other. Kaplan (1995) identified the value of restorative environments – those that reduce stress to improve attention – as having the common characteristics of providing a break from mental activity, offering a completely different experience that enriches the mind, and aligning with individual goals. Von Linden et al. (2017) connected the importance of restorative environments to the creation of health in salutogenic theory.

Kaplan (2001) also evaluated meditation as a restorative environment and described this duality of some practitioners who viewed contemplative practice as a respite (effortless) while others took a more disciplined and studious approach to their meditation time (effortful) and found that both approaches can provide relief from stress and improve attention. Thus, the students who described seeking out the yoga course as an escape and the students who intended to learn coping skills were both seeking out a restorative environment to improve wellbeing. Several participants (36, 93,134) identified the class environment as safe, welcoming, and accessible in their first impressions (Initial Reflections).

In these initial reflections, participants provided background information on their past experiences with yoga, reasons for enrolling in the course, and set goals for their learning during the semester. The initial reflections offered some insight into baseline stress levels and wellbeing, and a point of comparison for the practice journals where participants observed their emotions and feelings before and after practice throughout the semester.
**Student Journals: Checking in with Emotions**

Students in the introductory yoga course maintained a practice journal to bring awareness to emotions before practice, to set an intention for each session, and to observe feelings after yoga and contemplative work. Faculty guided students to accept how their feelings with a friendly, non-judgmental attitude using various rating systems including color coded cards (e.g., blue card = feeling sad, green card = energized, etc.), plush emojis with different emotion colors and expressions, numbering energy levels from 1-10, and other imagery for check-ins (All participants, Journals). Students often referenced conflicting emotions in their “before” practice journals, and this was an astute observation that was reflected often across participants who simultaneously felt tired and restless and anxious (All participants, Journals). When students took a moment at the beginning of class to journal, they initiated a key step in contemplative practice of paying attention in the present moment without judgment and observing that emotions are complex and conflicting at times.

Participants observed their emotional and energetic states before practice in order to set an intention for creating a more positive state during practice. In this process, participants documented the heavy weight of their stress and resulting fatigue repeatedly in their “before” practice log, and then frequently described a much lighter, more energized state after yoga practice. Participants noticed that yoga class supported their wellbeing through finding a sense of ease, supercharging, holding opposing forces, and preparing to tackle the day.

*Finding a Sense of Ease*

The first primary theme that participants connected to their feelings after yoga practice was finding a sense of ease. Yoga may be best known for the benefits of relaxation, and participants unsurprisingly reported feeling more relaxed and at ease after class. However,
students often used the word relaxation in conjunction with other qualities to describe their post-practice state more completely. Students used a combination of words to detail this sense of ease and relaxation by talking about how they felt happy, lighter, recovered, balanced, and peaceful. Participants frequently recorded their feelings of happiness within an overall positive state of psychological wellbeing after practice (Participants 13, 37, 38, 41, 58, 75, 78, 84, 99, 103, 109, 134, 138, 152, Journals).

**Happy.** Participants often mentioned being happy in conjunction with other elevated states such as feeling relaxed, grateful, or energized. In the qualitative sample, participants used the word “happy” in 43 post-practice journal entries to describe their shift in mood after yoga (Participants 13, 37, 38, 41, 58, 75, 78, 84, 99, 103, 109, 134, 138, 152, Journals). Some paired the word happy with more details on how or why they enjoyed the practice that day, and this often related to special types of practice (e.g., the Halloween class) or group work (Participants 99, 109, 134, 138, Journals). Meg (134) talked about her enjoyment of a class where students worked together to create a yoga practice to meet their energy needs:

> I loved this activity!! I thought it was so interesting to see what other people look for in their practice. I found we all saw benefit in postures that focused on the back, which we thought might be from having bad posture while being on computers. (Week 10 Journal)

While at times students discussed happiness as a temporary enjoyment of a fun or pleasurable class, they also conveyed a deeper sense of true happiness as well.

Yoga philosophy dictates that true happiness is not hedonistic pleasure but rather a feeling of inner peace that arises when a person is truly present (Hartranft, 2003). Participants exhibited this deeper happiness when they combined the word happy with other sentiments of inner peace including gratitude and connectedness. Marsha (152) noted, “During practice I felt
very light and appreciative of my surroundings and lucky to have what I do. After I am feeling so grateful and happy” (Week 13 Journal). Meg (134) connected the practice of lovingkindness meditation to increased happiness, “I love the idea of sending this positive energy to not only people I love, but also people I don’t know and don’t love” (Week 10 Journal). The participants described the basic emotion of happiness in a variety of ways, and the shift in their mood contributed to the theme of feeling lighter.

**Lighter.** Participants frequently discussed how they felt lighter in the post-practice journals, and some used this as a metaphor for letting go of fatigue and stress during the practice. Marsha (Participant 152) observed, “I am feeling very light and like a weight has been taken off my shoulders” (Week 14 Journal). While people should obviously feel relief during and after contemplative practice, this quality of lightness was a stark contrast to how participants described feeling overwhelmed before a 20–50-minute practice.

Participants repeatedly described how letting go of stress, anxiety, and worry during practice extended into additional benefits. And one student connected this to self-compassion. In the span of a single class, Laura gained the insight to be “able to let go of anxiety about school and lacking motivation and forgive myself for not always being 100%” (Participant 93, Week 6 Journal). Another student, Sally, found lightness in a specific class with Halloween-inspired postures and noted that “the poses were fun and laughing was fun” (Week 9 Journal, Participant 36). As participants experienced positive emotions, the sense of feeling recovered after class emerged as a theme within a sense of ease.

**Recovered.** As students observed the contrasting sensations of heaviness before practice and lightness after practice, they also commented on how they felt mentally and physically recovered by the yoga class. On one occasion, James (138) observed the sense of recovery on a
physical level as well as stress relief, “That was the perfect practice for what my body needed. It has been a stressful week” (Week 14 Journal). Several participants noted in their journals throughout the semester that they shifted pre-practice fatigue into feeling rested after practice (Participants 36, 69, 84, 138). Another student, Lisa (93), shared how yoga practice helped them release strong negative emotions one day, “I came out of this practice crying and feeling slightly healed” (Week 14 Journals). Other participants described less specifically how they felt more relaxed and less tense/stressed in after practice journals for both mind and body recovery (Participants 12, 36, 58, 74, 78, 84, 98, 103, 105, 109, 138). Participants also extended this feeling of being recovered into observing that they were more balanced after practice.

**Balanced.** Many students voiced feeling “balanced” in their post-practice journals using that specific terminology, while others expanded on finding that feeling of being grounded and centered (Participants 12, 37, 41, 78, 79, 99). The word “balanced” appeared in 13 post-practice journals across four participants (Participants 12, 41, 78, 79). Other students used similar terminology like Sean (99) who noted, “I feel a bit more evened out after class” (Week 14 Journal). While feeling balanced in the moment is important, participants also observed how the post-practice balance extended into daily life.

Participants mentioned how being in balance contributed to logical decision-making and productivity afterward. Renee (37) described how feeling more balanced could continue after practice, “I can do things in a rational and reasonable manner” (Week 13, 14 Journals). Emily (78) offered additional details on the connection of balance into a more productive state, “Chair yoga made me very calm and balanced, just what I needed to get a push on the day” (Week 2 Journal). The participants noted that they not only felt grounded, but also found inner peace and calmness during practice.
Peaceful. Participants often reflected on feeling peaceful and calm after practice, as opposed to the frantic and fatigued state before practice (Journals, Participants 103, 138, 152). Edith (103) made the connection between their own inner peace and interacting with family members, “Just like yesterday, I feel much better and calmer. I am now feeling more present and mindful for Thanksgiving with my family” (Week 13 Journal). Marsha (152) astutely noted this peaceful feeling while also accepting the reality of the external world, “I feel so relaxed and at peace with all the craziness” (Week 8 Journal). James (138) journaled about a walking meditation class activity that they repeated on their own, “I really just noticed how peaceful our world can be if you take a second to appreciate it on a Saturday morning. I could feel full serenity” (Week 8 Journal). Another participant, Sally (13), who had sustained high perceived stress throughout the semester still described finding these positive feelings during practice. During weeks 11 and 12, they wrote about feeling “serene, more accepting” and “less agitated and more at peace” in post-practice journals (Participant 13).

These participants and many others documented their ability to find peace within the real world during challenging times, both in-class and independent self-practices towards the end of the semester (Participants 103, 138, 152, Journals Weeks 8-13). The primary theme of finding a sense of ease encapsulated the participants feelings of peacefulness and other positive states (happiness, lightness, recovered, and balanced). While the students may experience transitory positive emotions, they also discussed how their improved emotional state moved them into a supercharged state and feeling energized, awake, capable, and rejuvenated.

Supercharging

Participants frequently observed that they were able to shake off fatigue during practice and recharge their energy levels. They wrote about this experience with direct references to
feeling energized, and also by documenting how they felt awake, capable, and rejuvenated in their post-practice journals (Participants 12, 13, 16, 37, 39, 41, 69, 74, 75, 78, 79, 84, 98, 99, 103, 105, 109, 134, 138, 152, Journals).

**Energized.** Participants referenced increased energy or feeling energized 74 times in post-practice journals throughout the semester (Participants 12, 13, 36, 37, 39, 41, 69, 74, 75, 78, 79, 84, 98, 99, 103, 105, 109, 138, 152). Renee (37) frequently noted that they had “energy to spare” at the end of practice (Journals). Marsha (152) observed the link between completing a more vigorous practice and gaining energy, “I did a more active practice today so after I feel very awake and energized (Week 13 Journal). In alignment with the supercharged theme, Barb (79) commented that they felt “zazzed, more than just jazzed” to describe heightened energy after practice (Week 14). Renee (37) described the transformation in their week 10 journal, “I got a large energy boost from almost falling asleep to barely feeling tired anymore. Opening the chest was what I needed today because I was tired and needed an energy boost.” Yoga philosophy espouses that practitioners increase their *prana* or energy by connecting mind and body through synchronous movement with conscious breath (Desai, 2004; Feuerstein, 1998; Iyengar, 1998; Villate, 2015).

Participants noticed that they improved their energy through yogic breathing (Participants 74, 79). Janet (74) connected specific breathing exercises to their improved state, “It really gave me something to focus and concentrate on. I also definitely feel an increase in my energy” (Week 6 Journal). Barb also made a similar observation, “My breath became fuller and deeper after practice. I feel a little energized” (Week 6 Journal). These observations align with the Sanskrit word, *prana*, that is translated by yoga practitioners interchangeably as “life force”,

“breath”, and “energy” (Hartranft, 2003; Iyengar, 1999). In addition to feeling energized overall, students specifically discussed feeling more awake as part of their post-yoga supercharged state.

**Awake.** In contrast to the pre-practice notations on exhaustion and fatigue, participants frequently noted feeling awake after practice. The sub-theme of being more awake was mentioned 29 times in journals across 11 participants throughout the semester (Participants 37, 69, 74, 98, 99, 103, 105, 109, 134, 138, 152). Some participants, like Victor, commented on more physical aspects of being awake, “I was feeling more awake and developed an appetite” (Participant 109, Week 14 Journal). Several participants described their awakened state in tandem with feeling stretched out, more flexible, taller, and warmed up (Participants 37, 74, 98 109, 134). Several other participants observed how specific physical postures or the overall type of class challenged them and woke them up (Participants 37, 74, 99, 109, 134, 138).

Students described increased mindfulness alongside feeling awake, including Marsha, “I am feeling much more awake and in the present. Before class I was just worrying about later today, now I am enjoying right in the moment” (Participant 152, Week 2 Journal). Another stated that they felt “very mindful and awake” (Participant 109, Week 12 Journal). Victor described how he moved out of fatigue during one practice, “After practice, I was feeling more awake. I pushed through my tired feeling and found the energy to be fully present during practice. I did my best to go through the full motion of each position” (Week 11 Journal). Participants also paired the word “awake” with similar sentiments of being supercharged such as energized, alive, alert, excited, and aware (Participants 37, 98, 99, 103, 152, Journals).

**Capable.** Participants noted the change in their feelings of capability and accomplishment as they were able to complete practices while staying focused (Participants 12, 37, 74, 78, 79, 99, 103, 134, 138, 170, Journals). Initially, in the journals from the first half of the
semester, students noted feeling accomplished and strong after practice. Emily (78) stated, “Astanga yoga made me feel very powerful like I can conquer anything” (Week 2 Journal). As the semester progressed, more participants made specific observations on feeling pride in the quality of their yoga practice (Participants 37, 134).

Renee (37) described feeling capable in their week 14 journal, “Today’s practice allowed me to feel calm and obtain synchronous breath with movement. We did the moves today with prompts which felt empowering and independent. I truly felt I improved.” Meg (134) made a similar observation the same week, “Today’s practice was really nice. I was proud of myself for completing a semi self-practice because I tried over Thanksgiving break and had a lot of trouble with focusing.” The participants recognized their growth across the semester when they talked about these self-practices. While following along with a yoga class is a step towards self-care, when students are able to actively design their own practice and stay focused internally, they have applied the coping skills independently. Their resulting feelings of confidence and power connect with other areas of supercharging.

Participants identified some overlap with the other sub-themes in the supercharged state as well. Janet noted a combination of these feelings that resulted in increased capability, “I feel more alive and really focused on this practice I feel good because I tried to steady my thoughts and not let my mind wander” (Participant 74, Week 12 Journal). Kasey described “feeling strong. Energy level 10. I was able to focus on my breathing and meditate with minimal distraction” (Participant 12, Week 13 Journal). Participants described the sense of accomplishment, strength, and power that highlighted their capability in post-practice journals throughout the semester (Participants 12, 37, 74, 78, 79, 103, 109, 134, 138, 170).
Rejuvenated. The participants also shared a sense of being rejuvenated during practice that was described in 26 post-practice journals (16, 41, 74, 78, 84, 93, 94, 98, 103, 105, 109, 138, 152). While participants noted feeling recovered within the theme of finding a sense of ease, the state of rejuvenation is distinct. Participants used more active language to describe feeling rejuvenated, including “feeling amazing” and “much more alive and less restless” and “feeling alive and well-stretched” in their post-practice journals throughout the semester (Participant 98, Week Journal). James directly incorporated the word rejuvenated in their journal, “I feel rejuvenated and better. My hips do feel tight but most of my body and mind feel better than when I walked in” (Participant 138, Week 3 Journal).

Two participants mentioned feelings of rejuvenation after a special outside yoga session and an outdoor walking meditation. Meg wrote, “I loved this activity and plan to do it again. Looking at all the changing leaves and seeing fluffy clouds in the sky without any distractions was so refreshing (Participant 134, Week 10 Journal). Edith also found this rejuvenating, “I really enjoyed doing yoga outside today. It was more peaceful and made me feel more in touch with not only myself but the world and nature” (Participant 103, Week 12 Journal). Some participants connected feeling rejuvenated with the next primary theme of readiness for the rest of their daily activities (Participants 16, 74, 105, 109, 138, Journals).

Preparing to Tackle the Day

Almost all participants identified that yoga practice helped them prepare for the day (or week) ahead, and they mentioned this theme across 64 journal entries. Some participants used more aggressive language that demonstrated the impact of yoga practice on their ability to manage heavy workloads. They used words like “conquer”, “attack”, and “tackle” in regards to upcoming tasks and daily in post-practice journals (Participants 16, 78, 138). Kim (16)
incorporated the Sanskrit yoga term *tapas* which means discipline in their week 15 journal, “After I feel relaxed and open to working hard this week. I will practice tapas in my life today by challenging myself and facing difficult obstacles.” James also remarked on the connection between relaxation and motivation, “My body and mind feel relaxed. I feel ready to attack the day” (Participant 138, Week 6 Journal). Emily (78) summarized, “I feel like I can conquer the day” in their week 10 journal. The participants emphasized active language regarding how yoga prepared them for the day that contrasted with their feelings of ease, and yet these are all interconnected.

While some participants used more assertive language, others expressed excitement and eagerness for the rest of their day. Marsha wrote, “After class I am feeling very awake and excited to see what today brings” (Participant 152, Week 14). Janet connected her reduced stress to increased zest afterward, “I am feeling a lot less stressed and feel a sense of relief. This practice was a good pick me up for the rest of my day” (Participant 74, Week 15 Journal). Similarly, Edith said, “I feel more energized and awake to enjoy the rest of my Monday!” (Participant 103, Week 11 Journal).

Other participants specifically referenced how practice supported their motivation and productivity. Todd wrote, “I thoroughly enjoyed practice today. I feel ready for the day and ready to set goals for the week” (Participant 105, Week 8 Journal). Janet discussed the mental reframing in this process, “I feel so relaxed. Instead of feeling stressed I’m going to turn it into a positive and tell myself I am productive when I get a lot done. Energy level is 10 out of 10!” (Participant 74, Week 3 Journal). Corey described how balancing their mood during practice shifted their entire state of being in readiness for the rest of the day, “After practice I feel much more calm and collected. I am not as worried about the activities that follow and I am happy. My
energy physically has subsided but I am mentally more aware and prepared” (Participant 58, Week 2 Journal). Similarly, Sean noted, “I feel a bit more relaxed which puts the amount of work I have to do in perspective. I feel ready to tackle all of the tasks I have to do.” (Participant 99, Week 2) As participants observed changes in mood and their overall state after practice, they noticed how two distinct feelings could occur simultaneously in the next theme of holding opposing forces.

**Holding Opposing Forces**

Participants frequently shared overlapping themes in their journal entries, but also described opposing emotions within the same entry. For example, several mentioned feeling both relaxed/calm while also excited/energized after practice (Participants 75, 84, 152). Similarly, Nate described feeling “relaxed, ready to go!” and “felt extremely relaxed, and less stressed. Felt I needed to do something vigorous after” (Participant 84, Week 9, 11 Journals). Another student, Kiki, commented that they felt “stressed but happy and energized” (Participant 41, Week 15 Journal). Marsha noted another seemingly contradictory sensation of “feeling very light and grounded” (Participant 152, Week 11 Journal).

Students also talked about differences in their energy levels and “good” tired versus “bad” tired. Hannah came into class feeling exhausted, and after practice was “still super tired but in a good way and a lot less stressed” (Participant 98, Week 5 Journal). Carmen also described feeling tired after practice but paired with positive sensations of being “more flexible” and “more loose” (Participants 26, Week 7 Journals).

One student, Laura, observed how they could hold different sensations in compartmentalized areas, “pit in my stomach is gone. Thoughts no longer racing. Body is completely relaxed. Physically, mentally still a little low” (Participant 93, Week 12 Journal).
They made a similar note in the following journal entry “physically feeling better, mentally head is clogged” (Participant 93, Week 12 Journal). Participants discerned where emotions and feelings were located in the body/mind very specifically and also demonstrated the mature understanding that opposing feelings can co-exist.

**Looking Back: Students’ Reflections on How Yoga Helped**

Students completed final reflections at the end of the semester where they answered questions on what they found most/least helpful aspects of the yoga course. They also discussed how contemplative practice improved wellbeing with specific questions on stress reduction and physical measures. Participants in the qualitative sample (n = 27) described the ways that yoga helped stress, improved fitness, and changed energy (All participants, final reflections). Several connected these improvements to becoming more self-aware and self-compassionate (Participants 12, 16, 36, 74, 84, 93, 94, 103, 105, 138, 152). Participants most frequently commented that the yoga course supported their needs by offering a set time for self-care in their schedules, and by teaching specific methods for breathing (Participants 4, 13, 16, 36, 69, 74, 78, 79, 93, 94, 98, 99, 103, 134).

Sean reflected on how the routine of a scheduled class improved wellbeing, “I noticed myself more conditioned to handle stress in the morning. I think having the time for contemplation and preparation doing yoga made it easier to make a plan for the day.” (99).

Students also mentioned how the yoga course provided a safe space to indulge in taking a break from the stress of daily life and have fun within the normal schedule. One participant, James (138), wrote about this aspect in their final reflection, “The most beneficial aspect of this class is it felt like a comfortable place to get your mind right for the outside world. It felt like a good getaway from the outside world which college students need sometimes.”
reflections students were able to share their broad perspective on the areas of yoga class that were valuable to them and supported their wellness goals. These reflections also provided another comparison point for how students viewed the changes in their stress across the semester. A summary of qualitative themes is depicted in Figure 4.7.

**Figure 4.7**

*Qualitative Themes Diagram*

- **Initial Reflections: Scheduling Self-care**
  - Pandemic Practice Online
  - Escape Vs. Active Coping

- **Student Journals: Checking in with Emotions**
  - Finding a Sense of Ease
    - Happy
    - Lighter
    - Recovered
    - Balanced
    - Peaceful
  - Supercharging
    - Energized
    - Awake
    - Capable
  - Preparing to Tackle the Day
  - Holding Opposing Forces

- **Final Reflections: Looking Back on What Helped**
  - Reduced Stress
  - Improved Fitness
  - Changed Energy
  - Increased Awareness and Self-compassion
Note. This diagram summarizes the themes from students’ reflective assignments.

Comparing PSS Scores with Participant Reported Stress

Creswell and Plano-Clark (2017) emphasized the importance of comparing quantitative and qualitative results within mixed methods study designs, and I compared the quantitative perceived stress scores to participants’ written reflections on stress and how their contemplative practice supported wellbeing. I had hypothesized that there would be some notable differences how participants talked about stress based on their level of perceived stress but did not find any evidence to support this theory. Students in all stress categories (from low to high) frequently described feeling heavy levels of stress, fatigue, anxiety, and overwhelming workloads in their initial reflections, journals, and final reflections. Additionally, participants all discussed improvements in their stress levels and ability to manage stress within their final reflections – except for one who identified as happy and stress-free all semester (84) – whether or not their PSS scores showed a decrease in perceived stress.

As I analyzed and compared the participants’ reflective work across the semester, I continuously evaluated differences between stress levels but did not find any convergence between the perceived stress scores and how students talked about stress. However, all participants talked about how the yoga benefitted their stress and overall wellbeing across all stress levels independent of their actual perceived stress scores. Their final reflections summarized these results for easy comparison.

Low Initial Perceived Stress

Participants (n = 7) in the qualitative sample with low initial perceived stress (0-13) did not experience dramatic changes in their PSS scores. Six participants remained in the low perceived stress level by week 11, and one reported low-moderate stress by that third data point.
Even though these participants scored their perceived stress as low, they still wrote about feeling stressed, and how they benefitted from yoga in their final reflections. Meg reflected:

I was very stressed this semester with applying to graduate school. In periods of stress, I would step back and do some yogic breathing with seated cat and cow. This small pocket of time let me redirect my thoughts and think logically. (134)

In addition to documenting what they found stressful in daily life; Meg described how they were able to incorporate yoga techniques to reduce stress outside of class.

Two participants described the temporary relief from yoga class and how that respite improved their wellbeing afterward. Laura wrote:

I found that even if my stress/anxiety arose the next day, I was always balanced and free of anxiety after my yoga practice that day. My stress management skills have improved because I have been able to practice meditation with better ease and being present, practicing gratitude, and breathing better. (93)

Emily’s final reflection supported how their attention during practice created the shift, “I can 100% say my mood and energy positively shifted after every single yoga practice. After each practice I feel blessed, happy, and balanced. During practice the only things I focus on are my breath and my movements” (78). Interestingly, one participant with low perceived stress described that they were happy and stress-free all semester, and still used powerful language to discuss the impacts of the course. Nate wrote, “One thing I learned was how life-changing a weekly practice can be I’ve become happier, healthier, and physically more fluid which has resulted in more strength” (84). As a whole, the qualitative participants with low stress shared that they still experienced challenges and potentially higher stress levels than their scores indicated.
The seven participants with low initial stress experienced zero to minimal changes according to their perceived stress scores, but they all reported numerous improvements to their stress and wellbeing in written reflections. Table 4.5 compares the quantitative perceived stress changes to sample statements from the qualitative final reflections in that category and summarizes the overall comparison for a mixed methods analysis. In the group of participants with low initial perceived stress (n = 7), six students reported their perceived stress in the low category at week 11, and one reported an increase to low moderate perceived stress. None of the participants in this qualitative group experienced perceived stress in the high-moderate or high category at any time. Participants described how yoga became part of their daily lives and affected multiple domains of their wellbeing.
Table 4.5

**Integrated Visual Display of Perceived Stress and Wellbeing: Low Initial Stress**

<table>
<thead>
<tr>
<th>Quantitative Results</th>
<th>Qualitative Example Quote</th>
<th>Mixed-Methods Comparison</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Initial PSS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Change</td>
<td>I tried to create a better mindset and live a better life for myself going forward. I would breathe more, and I would even stop to meditate sometimes. I have never done that before and it was great for me. This led to better sleep and more energy towards ends of week. (138)</td>
<td>Perceived stress scores were low at initial and final measurements. However, these participants frequently described feeling stressed. Only one of the low stress participants (84) said that they were happy and stress-free all semester.</td>
</tr>
<tr>
<td>(n = 6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low Initial PSS</td>
<td>I noticed I was at ease, my mind was less full of unnecessary thoughts, and that my mornings were more balanced on the days I had yoga...moving my body and stretching every day to make my body and muscles feel better. I also have been taking the time each day to practice meditation for my mental sanity and it has been helping to live a more peaceful lifestyle. (103)</td>
<td>Perceived stress score increased, but they described improved wellbeing.</td>
</tr>
<tr>
<td>Increased to low-moderate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(n = 1)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note.* No participants with low initial perceived stress increased to high-moderate or high levels.

The analysis of students with low perceived stress could easily be overlooked as unimportant because they might be considered at a lower risk of mental health concerns, but the qualitative data and comparison to perceived stress demonstrated that these students experience stressors that are not obvious in their PSS scores. Additionally, even if these students are at a reduced risk,
they all reported immense benefits from the course that could prevent future stress-related problems.

**Low-Moderate Initial Perceived Stress**

The qualitative participants with low-moderate initial perceived stress (14-20) also experienced minimal changes in PSS scores, and they still described how the course was important for their stress management. Victor observed how their mindset changed:

> In terms of stress, I notice now that I am able to take a step back from my typical thought process and analyze things from a better perspective. Yoga has allowed me to slow down and breathe in times of stress and worry. (109, Final Reflection)

Two other participants specifically referenced how different types of practices impacted their mood and emotional state. Barb connected contemplative practice to physical sensations and mental wellbeing:

> I feel like the meditation portions of class were most valuable to me. I noticed that when stressed or anxious, my breath is very shallow and it can be hard to breathe deeply and calm down. Through meditations in class, I am able to let the anxious thoughts pass me and I can allow myself to breathe deeper. (79, Final Reflection).

Another student, Pam, who reported stable perceived stress scores across the semester, wrote about the changes they experienced from the physical posture practice (asana),

> I never came into class in a bad mood I was always mellow or tired. However my mood does improve especially after asana it was really relaxing and always made me forget my stress and focus on my breathing (39, Final Reflection)

Although participants with low-moderate initial perceived stress scores reported minimal changes with 5 out of 7 participants remaining at low-moderate perceived stress at week 11 (1
student moved to low stress, and 1 student moved to high-moderate), they still described feelings of anxiety and the ways that yoga improved their wellbeing.

The participants who initially reported low-moderate perceived stress may have experienced minimal changes in PSS, but they all reported ways that contemplative practice supported wellbeing and stress management. In Table 4.6, sample reflective statements are compared with the changes in perceived stress alongside a mixed-methods summary comparison. Participants in this group (n = 7) mostly stayed in the low-moderate category at week 11, but one student decreased to low perceived stress, and one increased to high-moderate perceived stress. No students increased to high perceived stress. The participants with low-moderate perceived stress reflected on how they changed their state of mind, became more grateful, and found a respite from stress in yoga class.
Table 4.6

Integrated Visual Display of Perceived Stress and Wellbeing: Low-Moderate Initial Stress

<table>
<thead>
<tr>
<th>Quantitative Results</th>
<th>Qualitative Example Quotes</th>
<th>Mixed-Methods Comparison</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low-moderate PSS decreased to low (n = 1)</td>
<td>I have made a lot of changes within my mind to become more grateful of all the things that I have in my life even if it is the littlest thing. (98)</td>
<td>Perceived stress score decreased, and participant noted results of dedicated practice</td>
</tr>
<tr>
<td>Low-moderate no change (n = 5)</td>
<td>Yoga has changed my perspective on the things that truly matter in life...during our yoga practice I only focus on what’s in front of me. All of the things that stress me out, suddenly disappear when I’m practicing yoga. Going to yoga this semester has been a safe place for me and I have really enjoyed it. (41)</td>
<td>Perceived stress stayed at a low-moderate level, and participants talked about the ways that they used contemplative practice to manage sustained stress. Focusing on breathing, present moment awareness, and taking a new perspective</td>
</tr>
<tr>
<td>Low – Moderate PSS increased to High – Moderate (n=1)</td>
<td>My yoga and meditation practices were extremely helpful in managing my stress. Practicing allowed me to take my mind off of school and work and focus on myself for a couple of hours. It gave me breathing techniques for when I felt overwhelmed and allowed me to think about what I was grateful for in my life and what I needed to cut out. (16)</td>
<td>Perceived stress increased, but participant found relief in contemplative practice.</td>
</tr>
</tbody>
</table>

*Note. No Participants with low-moderate initial perceived stress increased to high levels

These participants with low-moderate perceived stress scores could also be easily overlooked as low risk and exhibiting minimal change without the qualitative descriptions of their stress and the ways that contemplative practice supported wellbeing.
High-moderate Initial Perceived Stress

The qualitative participants (n = 7) with high-moderate initial perceived stress (21-26) demonstrated a more varied pattern in perceived stress scores across the semester but expressed similar experiences in the course to the lower stress levels. In this group, the PSS levels increased at week 7 for two participants, decreased for three, and remained at high-moderate for two students. At the week 11 data point, 4 out of 7 students ended with lower stress levels, and 3 out of 7 remained in the high-moderate level.

Cara, whose stress decreased to low-moderate, wrote, “Being in yoga has allowed me to focus in the moment. At the beginning I would think about things I could not control. When I’m in yoga I am less stressed” (Participant 170, Final Reflection). Another student, Kasey, reported an increase to high stress at week 7, but then scored a subsequent decrease to low-moderate perceived stress by week 11. They reflected, “I think my stress greatly decreased this semester from practicing yoga. I was able to ground myself at least once throughout the week which was very beneficial. I also feel more in tuned with my body since practicing” (Participant 12, Final Reflection). While these participants expressed feelings that aligned with their perceived stress scores, other participants who reported no change or negative shifts in perceived stress also described how yoga helped.

One student, Sally, whose initial perceived stress increased from high-moderate to high at week 7 and subsequently decreased by to the initial high-moderate score shared their learning process:

This class has taught me how to either slow down my thoughts or allow myself to have peace on my bleh days. Many days I would come in to class with 100 things on my mind and then leave class with one and that would be the “right now”. Other days I would
come in bleh or down because I felt I wasn’t doing enough or behind but I would leave more relaxed and at ease. (Participant 36)

In the high-moderate level, participants again all expressed feelings of stress and overload and described how yoga was helpful.

The participants with high-moderate perceived stress did not include dissimilar reports of their daily mood/energy that would indicate they were a higher risk group, but their perceived stress scores were more variable across the three data points. However, all participants in this qualitative sample talked about the importance of the yoga course regardless of their changes in perceived stress. In table 4.7, the quantitative changes in perceived stress are compared with sample reflective statements and summarized. Those with high-moderate stress (n = 7) had scores above the mean initially, which also means that they had greater potential for significant decreases in PSS.
### Table 4.7

**Integrated Visual Display of Perceived Stress and Wellbeing: High-Moderate Initial Stress**

<table>
<thead>
<tr>
<th>Quantitative Results</th>
<th>Qualitative Example Quote</th>
<th>Mixed- Methods Comparison</th>
</tr>
</thead>
<tbody>
<tr>
<td>High – Moderate PSS decreased to Low (n = 1)</td>
<td>I am more aware if my tongue is stuck to the roof of my mouth. I’m usually stressed if it is so I try to relax it and try to remedy why I’m feeling stressed. (94)</td>
<td>Perceived stress decreased, and participant found that observing a physiological stress response was helpful.</td>
</tr>
<tr>
<td>High-Moderate decreased to Low-Moderate (n=3)</td>
<td>Yoga and meditation were DEFINITELY helpful in managing my stress! I have had the worst year of my life this year and have been dealing with a lot at home and with my family that has caused me great stress. I looked forward to ... because I knew it would be a designated time to not think about any of my worries and... to focus on my mental and physical health. It felt good to release any stress both through the yoga postures as well as the savasana. (74)</td>
<td>Perceived stress decreased, and participants described the benefits of a designated time for self-care.</td>
</tr>
<tr>
<td>High – Moderate no change (n = 3)</td>
<td>Changes I have made to support wellness are, practicing self-love mainly. Wellness is about much more than being physically fit, so whenever I am not treating myself with respect or maybe not nourishing myself the best I can, I try to help myself instead and treat me like someone I love. This helps with emotional, physical, social, spiritual, and intellectual dimensions of wellness. (152)</td>
<td>Perceived stress scores did not change but participants documented how contemplative practice helped them take care of themselves and maintain wellbeing.</td>
</tr>
</tbody>
</table>

*Note.* No Participants with high-moderate initial perceived stress increased to high levels

While one student reported a dramatic decrease into the low category, their qualitative reflection...
on stress mostly centered on learning to recognize a simple physiological response to stress (tongue on the roof of their mouth). Three other participants experienced a drop into the low-moderate category and three participants were still in the high-moderate level by week 11. As shown in table 4.7, they all reported benefitting from the scheduled time for self-care and improved wellbeing. None of the participants recorded an increase to the high level of stress.

**High Initial Perceived Stress**

The qualitative participants (n = 6) with high initial perceived stress (27-40) also reported varied changes in PSS scores across the semester. One participant’s perceived stress level dropped all the way into the low group by week 7, and this reduction continued through week 11. Two participants’ PSS levels dropped to low-moderate, and two reduced into the high-moderate level. Only one participant in the qualitative sample stayed in the high perceived stress category all semester. Participants with high stress shared similar reports to other stress categories on the ways that contemplative practice improved their wellbeing.

Participants retrospective views of the perceived stress assessments showed that they did not always notice the changes in stress over the semester. Georgia, who reported a decrease into the high-moderate level with an overall PSS decrease of 9 points wrote, “I don’t think I improved on stress assessments. Stress management is definitely something that I am still continuing to work on!” (Participant 75, Final Reflection). In retrospect, they either did not see or remember the changes across the semester. However, Georgia did also reflect on how their breathing and mood improved as a result of yoga class (Participant 75, Final Reflection).

Mark, the participant with the most dramatic decrease from the highest level to the lowest level of perceived stress, stated, “I saw quite a difference of my outlook of the week to come and after yoga, I felt so much more at ease” (Participant 4, Final Reflection). One of the participants
who decreased by two PSS levels across the semester, Todd, remarked, “The most beneficial aspect of this class was the role in played in my mental health. It was so important to helping me find a drive in every day” (Participant 105, Final Reflection). These seemingly simply comments, while important, are not a dramatic as their drastic reductions in perceived stress. However, other aspects of Todd’s reflection provided evidence for the benefits that they experienced during the course through better self-care and mental wellbeing.

While participants with the highest perceived stress many be at an increased risk of serious mental health concerns overall, their reflections on stress were similar to participants with lower stress levels. In Table 4.8, I again compared their PSS changes to the qualitative student reports and summarized the mixed-methods analysis. As seen in the high-moderate group, one student reported a substantial decrease to the lowest PSS level with a reflection on a specific technique of focusing on the breath that they used in daily life. Two participants experienced a decrease and described improved mental health despite their initial skepticism about yoga. The final two participants who reported a smaller decrease noted improved stress management and observed that they needed to further develop their coping skills. The only student who maintained a high perceived stress level reported great improvement in their ability to cope in their final reflection while also acknowledging that they continue to struggle. While the group of students with highest perceived stress might initially appear to be at greatest risk, they also had the most room for improved wellbeing.
Table 4.8

Integrated Visual Display of Perceived Stress and Wellbeing: Reflections: High Initial Stress

<table>
<thead>
<tr>
<th>Quantitative Results</th>
<th>Qualitative Example Quote</th>
<th>Mixed-Methods Comparison</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Decreased to Low</td>
<td>I stress less about approaching tasks. I realized that the tasks are coming regardless of how much I stress over them. I started focusing on my breath more so just before exams or presentations. It works so well. (4)</td>
<td>Perceived stress dropped dramatically, and the participant identified a specific technique for coping with stress.</td>
</tr>
<tr>
<td>(n = 1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Decreased to Low-</td>
<td>Very strange at first, I wasn’t totally convinced yoga could play a role in mental health but as time went on, I noticed how I’d treat myself better after practices. I’d come home make myself a big breakfast and then complete most If not all my homework immediately after practices. Practice actually played a large role in my stress level this semester. (105)</td>
<td>Perceived stress decreased by two levels, and the participant provided an example of how practice contributed to overall self-care.</td>
</tr>
<tr>
<td>Moderate (n = 2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Decreased to High-</td>
<td>I feel the breathing exercises were the most beneficial. It really helps me in times of anxiety and it helps minimize stressors often for me. I think that it has helped me a lot with mental and physical health sometimes I just step away for a second from overwhelming tasks to breathe now which is something I did not know how to do before. (69)</td>
<td>Perceived stress dropped by one category, and participants noted focusing on the breath as pivotal as well as an ongoing need for stress management.</td>
</tr>
<tr>
<td>Moderate (n = 2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High – no change</td>
<td>I greatly improved on learning to not stress about things not in my control, but I still have work to do...Using yogic breathing and breath meditation has allowed me to divert myself from overthinking about stressful situations. (13)</td>
<td>Perceived stress remained high all semester, but the participant gained emerging coping skills.</td>
</tr>
<tr>
<td>(n = 1)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. Participants in the high stress group reported the greatest variability in perceived stress.
All participants did write about significant stress-related symptoms including fatigue and anxiety, and they also detailed aspects of contemplative practice that improved their mood, energy, and physical wellness (All participants, Final Reflections).

Summary

In this chapter, I shared the quantitative results on perceived stress and contemplative practice frequency and the qualitative reflections from student participants. Participants’ mean perceived stress decreased significantly, while their mean contemplative practice frequency increased. Additionally, I examined individual changes in stress categories and these results highlighted that a group mean does not tell a complete story. The qualitative analysis filled in the gaps with students’ stories on how yoga was helpful in specific ways, and also illuminated that perceived stress scores may not show whether or not a student benefitted from learning contemplative practice. In the next chapter, I will discuss these results in more detail with their significance to current literature, and I will also detail the limitations of the study with recommendations for future research.
Chapter V: Discussion

In this explanatory sequential mixed-methods study, I explored how college students experienced changes in relation to wellbeing throughout a semester-long yoga course during the COVID-19 pandemic. In the initial quantitative phase, participants (n = 121) rated their perceived stress and contemplative practice frequency in surveys during weeks 3, 7, and 11 of the 16-week semester. Then, in the second qualitative phase, I analyzed the participants’ reflective assignments from the course to expand on how they experienced changes in perceived stress and other aspects of wellbeing. I organized the students’ reflective work in time order of initial reflections, practice journals, and final assessments for triangulation with the data on perceived stress.

Participants reported varying levels of perceived stress, and their mean perceived stress decreased across the semester. However, the students’ qualitative reflections offered a more in-depth picture of the intensity of their stress and the ways that yoga supported wellbeing. All participants (except one who reported always being “happy and stress-free”, Participant 84, Final Reflection) in the qualitative sample (n = 27) reported feelings of stress, overwhelm, fatigue, and anxiety in their pre-practice journals and reflections throughout the semester. They also described the ways that yoga practice positively impacted their quality of life regardless of their stress level.

In this chapter I will: (a) summarize the study results, (b) describe the integration of the theoretical framework, (c) discuss the quantitative, qualitative, and mixed methods results, (d) acknowledge the limitations of this research, (e) detail the implications within higher education, and (f) recommend a path for continued research of yoga and contemplative practice.
Summary of Study Results

The purpose of this study was to explore how college students experienced changes in relation to wellbeing while enrolled in a semester-long yoga course. I implemented an explanatory sequential mixed method design (quan → QUAL) to gather basic data in the initial quantitative phase and followed this with a more in-depth analysis to explain these results in the second qualitative phase (Creswell and Plano-Clark, 2017). Through these two phases, I sought answers to four sub-questions:

In the initial quantitative phase, I used survey methodology to answer:

1. To what extent does perceived stress among college students change during a semester-long yoga course?

In the second qualitative phase, I incorporated a case study approach to answer:

2. In what ways do students experience changes in wellness throughout a semester-long yoga course?

3. How do college students describe aspects of the yoga course that support their wellbeing?

For the mixed methods comparison, I addressed the question:

4. To what extent do the quantitative results on perceived stress agree/disagree with the student reflection on the benefits of yoga for psychological wellness?

In the next section, I will summarize the methods and results for the quantitative and qualitative phases in this study and provide answers to these research questions.

In the initial quantitative phase of this study, I used a survey design to collect data on perceived stress, contemplative practice frequency, and demographics from all consenting students (n = 172) in the introductory yoga course during the third week of the Fall 2021
semester. I again gathered data on perceived stress and contemplative practice weeks during the 7th and 11th weeks of the 16-week semester and analyzed that data for students who completed all three data points (n = 121) using a repeated measures ANOVA test in SPSS. As I detailed in Chapter IV, the students’ perceived stress scores decreased at a statistically significant level between weeks 3 and 11 and weeks 7 and 11. Additionally, the participants’ contemplative practice (yoga, meditation, and mindfulness) frequency increased at a statistically significant level between week 3 and week 7, and between week 3 and week 11. Meanwhile, after an initial review of the week 3 PSS data, I selected a smaller qualitative sample (n = 32) through a random stratified sample based on four categories of stress (i.e., low, low-moderate, high-moderate, and high).

For the qualitative phase, I analyzed the reflective work of the participants from the smaller sample who completed all three PSS data points (n = 27). I followed a constant comparative method with process coding to inductively code students’ initial reflections, daily practice journals, and final reflections throughout the semester. I observed separate themes within each type of reflective data. In their initial reflections, students described motivating factors for enrolling in the course and the need for a scheduled time for self-care emerged as a primary theme. Under this primary theme, I identified two sub-themes: (a) students who sought out yoga because they started practicing online during the pandemic and (b) students looking for a restorative environment to escape or to actively learn coping skills for stress. Next, I observed how students talked about changes in their emotions in the daily practice journal within the primary themes of finding a sense of ease, supercharging, holding opposing forces, and preparing to tackle the day. The primary theme of finding a sense of ease include the sub-themes of feeling happy, lighter, recovered, balanced, and peaceful. The primary theme of supercharging was
established around the sub-themes of feeling energized, awake, capable, and rejuvenated. I analyzed the two additional primary themes of holding opposing forces and preparing to tackle the day as separate and foundation without any sub-themes. I used the distinct time points of the qualitative data as an additional point of triangulation during the mixed methods analysis.

In the final stage of mixed methods analysis, I compared the changes in perceived stress to the themes from the participants' reflections. I found that the participants’ final assessments where they retrospectively discussed their stress and how yoga supported wellbeing were particularly informative in this stage. I observed convergence between the overall statistically significant decreased in perceived stress and the students’ reports of how the yoga course helped them manage stress. I also noted divergent findings after comparing individual changes in perceived stress with students’ reflection because there was no clear difference between stress levels in the qualitative data. All participants discussed specific ways that contemplative practice improved their wellbeing, but this decrease in qualitative descriptive stress did not necessarily align with their quantitative perceived stress scores.

In summary of the key findings, students (n = 121) reported a statistically significant decrease in perceived stress across the three time points ($F(2, 119) = 5.02, p<.01$). Students also described improved wellbeing in their journal entries with themes of finding a sense of ease (happy, lighter, recovered, balanced, peaceful), supercharging (energized, awake, capable), preparing to tackle the day, and holding opposing forces. Finally students’ reflections depicted how they used yoga and contemplative practice to manage their high rates of stress. In the next section, I will discuss how my theoretical framework formed the basis for this study and how experiential learning theory, integral/integrative education, and salutogenesis connected to the results.
Integration of the Theoretical Framework

In Chapter II, I proposed how the three theories of experiential learning, integral/integrative education, and salutogenesis informed this study of stress and yoga education in college students during a global pandemic. Experiential learning theory melded with the process of students learning yoga and contemplative practice through continuous cycles of reflection and activities. Integral/integrative education is also an experiential and reflective process that supplied the foundation for bringing together mind, body, and heart within the higher education setting. I found salutogenesis critical as a model for stress and coping in understanding how participants reported high stress levels while simultaneously describing relief from stress as a result of the course. As I analyzed the data, I used these theories to guide my interpretation and understanding of the qualitative data and connection to the perceived stress scores.

Experiential Learning Theory

Kolb’s (1984) main premise of experiential learning theory (ELT) was that learning is an integrated process of experiencing, perceiving, thinking, and behaving. The students’ journals documented this experiential process within each class and across the semester. Students engaged in yoga and contemplative practice, observed their feelings before and after each class, reflected on how their experience changed their thinking, and then ultimately changed their behavior. For example, Emily wrote in their week 2 journal:

Takeaways: This yoga really help me connect with my breath. I’ve been having trouble sleeping comfortably since moving back to school and I did not even realize until I asked this question, but since this yoga class I have slept so much better the past two nights.
They identified the conflicting emotions of being both energized and anxious before practice, experienced relief through practice, and thought about how this changed their sleep behavior. Another student, Victor, documented using this cycle on a day when he unexpectedly missed class:

Today I woke up and was able to shower and eat breakfast before practice. It felt nice being able to leave for practice feeling fresh and energized. I did not make it to practice because my car got a flat tire on the way to practice. I decided to practice Yoga Nidra when I got home and before I go to bed to help calm my mind from the stresses of today.

(Participant 109, Week 5 Journal)

Following the experiential learning process cycle, Victor used their past practice experience to choose yoga nidra, a meditative yoga practice, to manage stress outside of class, and this reflection and cognition changed their behavior.

While the yoga course was inherently experiential as an activity-based course, participants wrote with greater enthusiasm about “special” sessions (Journals, Participants 99, 109, 134, 138). There is a routine to yoga practice that loses novelty over time, but this rhythm is important for learning and for settling the nervous system. Instructors balance the repetitive nature of practice with novel learning or special classes. Participants described how energized they felt after the Halloween-inspired classes, group activities where they developed their own practice routines, and outdoors yoga and meditation experiences (Journals, Participants 99, 109, 134, 138). Victor wrote in their week 5 journal:

Practice today was really fun! I enjoyed seeing the people who came in dressed up and thought the Halloween themed positions were cool. The position involving the witch sitting on her broomstick was an interesting one. I was able to fully lift myself off of the
ground when I attempted the pose but could only hold it for a few seconds at a time. After practice, I had fun making an 8-limbed tree diagram. My group got along very well, and it was nice to get to talk with new people. Practice put me in a great mood and was a fun way to start my Halloween.

They documented how these novel experiences combined for a fun experience that changed their mood going into the day. Meg shared how taking contemplative practice outside enhanced their learning:

I’m very excited about walking meditation today. I want to take this time to enjoy the beautiful weather. I loved this activity and plan to do it again. Looking at all the changing leaves and seeing fluffy clouds in the sky without any distractions was so refreshing.

(Participant 134, Week 6 Journal)

Meg’s observation reflects the importance of educating within nature and the outside world as part of the experiential learning process (Kolb et al., 2001). Edith also wrote about an outdoors session, “I really enjoyed doing yoga outside today. It was more peaceful and made me feel more in touch with not only myself but the world and nature” (Week 7 Journal). ELT posits that learning takes place in all areas of students’ lives and teachers should always incorporate the application of knowledge in the greater world (Kolb et al., 2001).

The yoga course incorporated the four stages of ELT (concrete experience, abstract conceptualization, reflective observation, and active experimentation) as part of students’ regular routine in every class session. As students participated in these stages of activity-based learning, they experienced the integration of mind and body and connection to their daily lives that is a goal of integral/integrative education (Kolb et al., 2001; Esbjörn-Hargens, 2010).

*Integral/Integrative Education*
Integral education theory and integrative education both have many origins across geographical location, culture, and history with the shared message that true learning addresses the whole student. Palmer (2010) also emphasized the importance of the authentic and reflective teacher in bringing the lost heart and spirit back to education. While modern teaching focuses mainly on compartmentalized cognitive outcomes, a contemplative education reunites mind, body, and spirit. As with ELT, an integral education is holistic and incorporates all areas of students’ lives into the classroom and spreads the lessons from the classroom into daily life. Students commented on this connection of mind/body/spirit including, Renee’s post-practice observation:

Reaching for the sky and inhaling lifts you up physically but emotionally as well. Warrior one and warrior two I enjoy because they allow me to work in my posture and also allow me to feel enlightened and powerful. It gives me strength with the wide stance and to stretch as well. Being physical and moving in the morning helps positivity I implemented this recently and it allows me to be more awake in the mornings. (Participant 37, Week 2 Journal)

Renee’s statements illustrate the whole-person impacts of yoga postures from their increased physical strength to emotional alertness and spiritual empowerment. Cory also described the distinction between sensations in body and mind and how they achieved balance in their week 2 journal entry:

Before: I am feeling stressed, anxious but overall I am happy. Physically I feel full of energy, but mentally I am a little drained and tired.

Intention: My intention for today is to expel some of my energy and leave happier and excited for the remainder of my day.
After: After practice I feel much more calm and collected. I am not as worried about the activities that follow and I am happy. My energy physically has subsided but I am mentally more aware and prepared.

Some students also commented on specific aspects of the mind/body connection, as Sally noted, “Reclining spinal twist felt really good on my back. Pillows make the posh positions very comfy. I have never been that relaxed. I really was in tune with my body and achieved mindfulness (Participant 36, Week 7 Journal). While Sally observed how body positions supported the mind/body connection, Emily wrote about how pre-practice caffeine interfered with this union:

I had a coffee right before class, note to self never do that again. I was very shaky during practice because of it and during savasana (rest) my mind kept getting distracted.

However, I still feel more balanced than before practice. (Week 12 Journal)

Another student, Edith, described the complexity of the mind/body/spirit interaction when she was ill one day:

I am feeling a little bit better. I really practiced focusing on my breath because I felt anxious and my heart rate was higher than normal. Overall, this helped me feel a little bit better and my body more at ease. (Week 12 Journal)

These participant quotes demonstrated their development of a mature understanding of holistic wellbeing and cultivation of balance in all areas as part of integral/integrative education theory. They also described how focusing on all parts of their being spread out into other courses and daily life. Janet was anxious about a speech in an upcoming class and set an intention to soothe themself during practice, noting, “After my nerves feel so much better. The end relaxation made me feel so relaxed I thought I was sleeping” (Week 8 Journal). Another student, James, related to how the mind/body work eased his overall busy schedule:
I am pretty energetic, but also stressed out this morning. I have so much work in these weeks coming up. I am hoping for a relaxing practice to clear my head for an hour. After that practice not only helped my mind, but also helped my body. It opened me up, I was really tight. (Week 13 Journal)

While Janet and James reflected on how yoga practice eased mind and body and helped with academic and scheduling stress, Edith found that this wholeness supported their relationships. Edith wrote about feeling anxious over the holiday break and chose to complete a walking meditation self-practice, noting afterward, “I am now feeling more present and mindful for my Thanksgiving with my family” (Participant 103, Week 13 Journal). The participants found that the benefits of contemplative practice impacted their wellbeing not only in yoga class, but also in their daily lives (Participants 36, 74, 78, 103, 138). Integral/integrative education theory proposes that these goals of mind/body/spirit union and continuity between inner/outer worlds are valuable (Aurobindo, 1939; Esbjörn-Hargens, 2010).

Allen et al. (2018) outlined a path from individual wellness journeys through the ELT process to resulting feelings of holistic wellbeing, and they proposed that all people could create this high-level wellness through a salutogenic orientation. While Allen et al. (2018) did not directly reference integral/integrative education or yoga philosophy, they incorporated overlapping concepts from both areas including the equivalence of wellbeing to finding inner peace through self-reflection, self-compassion, and the quest for the true self (Aurobindo, 1939; Esbjörn-Hargens, 2010; Hartranft, 2003). Thus, the salutogenic model serves as an underlying theory to view how the approaches of experiential learning plus integral/integrative education offer a framework for yoga and contemplative practice to achieve high-level wellness (e.g., inner peace).
Salutogenesis

Antonovsky (1979) developed the salutogenic-stress theory when he wondered why some people with very adverse and traumatic experiences (e.g., Holocaust survivors) suffered from chronic illness while others flourished. He identified that individuals all had different generalized resistance resources (GRRs) such as their genetic emotional predisposition, environment, and social support systems that impact their ability to handle stress. Antonovsky (1979) also considered the role of various specific resistance resources (coping skills) to mediate their sense of coherence (SOC). The SOC is the degree to which people find the world comprehensible, manageable, and meaningful, and this sense of coherence can ultimately impact their ability prevent stress from negatively impacting health (Antonovsky, 1979). Antonovsky saw that salutogenesis, or high-level wellness, was possible for everyone with the proper SRRs and proposed that public health focus on creating wellbeing instead of treating diseases. Yoga and contemplative practice offer one practical method for teaching coping skills (e.g. specific resistance resources or SRRs) in an experiential and integrative education environment.

While European researchers have studied salutogenesis in greater depth than those in the United States, the underlying desire for high-level wellness has become increasingly popular and evident in higher education course offerings. Dr. Laurie Santos is renowned for teaching Yale’s most popular course in the past century, Psychology and the Good Life, and teaches college students evidence-based strategies to train the mind and maintain wellness. They also have a podcast, The Happiness Lab, but many of these evidence-based strategies have been part of yoga teachings for thousands of years. Through yoga and contemplative practice, students can use their breathing to retrain the nervous system to respond to everyday stress with a calm, positive approach. They learn to pause before reacting hastily, and to give themselves time and space to
process difficulty emotions. Students quickly comprehend that they can shift a negative morning mind overloaded with a bulging to-do list into a relaxed energy where doing their best with happiness is enough. When they experience the relief from self and society-imposed stress, they reduce the risk of “dis-ease” and cultivate salutogenesis (Antonovsky, 1979).

Figure 5.1
Application of Theoretical Framework Diagram

Class Experiences:
- Scheduled self-care
- Journaling → Practice cycle
- Novel activities

Participants described:
- Mind/body/spirit connection
- Inner and outer worlds

Students shifted emotions:
- Released stress and fatigue
- Finding a sense of ease
- Preparing to tackle the day
- Holding opposing forces

Students reported:
- Ability to manage all levels of perceived stress
- Use of yoga as a path to make life meaningful, manageable, and comprehensible

Note. This nested diagram represents the overlapping theories used in this study with a salutogenic perspective as a lens for understanding the impacts of yoga and contemplative practice as an integral/integrative method for experiential learning.
I incorporated the inherent principles of experiential learning theory and integral/integrative education theories to support the use of yoga and contemplative practice in this study. The salutogenic model completed the theoretical foundation for this study with an understanding of how individuals experience and mediate stress through the development of coping skills. In Figure 5.1, I have represented how these overlapping theories and methods are nested together with salutogenesis at the core, yoga and contemplative practice as the method, and integral/integrative education as an experiential approach for implementation. These theories could also easily be depicted in reverse order with students using the experiential learning process to find wholeness within yoga and contemplative practice and understanding how to achieve a salutogenic orientation in life.

**Discussion of Results**

Based on my own history as a yoga practitioner and teacher, I was aware that many people report transformative changes when they begin a dedicated practice. I also understood based on my direct experience that yoga practitioners still endure significant stress in daily life, and that yoga is not a fix or cure for trauma. While contemplative practice offers tools for mitigating the impacts of stress on the mind and body, stress is unavoidable (Antonovsky, 1978; Selye, 1993). As a teacher in higher education, I have also witnessed the increases in fatigue, anxiety, and overload among the student population (ACHA, 2019, 2021). Based on anecdotal student reports, I hypothesized that yoga and contemplative courses offered one possible option to ameliorate the mental health crisis among young adults in college. There was also evidence in the research to support my prediction that college students could improve their ability to manage stress through contemplative practice (Bamber & Schneider, 2016, 2021; Brems et al., 2015; Crowley & Munk, 2017; Mafouz et al., 2018).
Revisiting the Literature

After reviewing the literature and reflecting on my own teaching environments, I understood many of the limitations in studying contemplative practice. Researchers have struggled to identify a yoga prescription – or what constitutes the proper method, dose, and duration for practitioners with a variety of conditions (Bamber & Schneider, 2016; Breedvelt et al., 2019; van Aalst, 2020). Additionally, scholars and researchers have failed to agree on both the definition of yoga and the goals for practice (Cramer et al., 2016; Ergas, 2014).

As yoga moved from the East into Western culture, the physical aspect of movement has overshadowed the holistic nature of the ancient tradition (Antony, 2016; Bartholomew, 2020; Cramer et al., 2016). The Sanskrit word asana has become synonymous with yoga, as opposed to yoga referring to a fully integrated path for daily living (Desai, 2004; Ergas, 2014; Feuerstein, 1998). Yoga, conscious breathing, meditation, mindfulness, ethical precepts, and the bliss experience all fit under the umbrella of contemplative practices; and different traditions and teachers combine the various aspects in a multitude of practice styles (Antony, 2016; Bamber & Schneider, 2016, 2020; Bartholomew, 2020; Beck et al., 2017). These basic challenges have instigated debate and difficulty among yoga researchers, and scholars have argued that there is no purpose in developing a yoga prescription (Desai, 2004; Ergas, 2014; Feuerstein, 1998).

The Trouble with a Yoga Prescription. Scholars have argued that researchers’ need for a yoga prescription misses the point of contemplative practice and reinforces the dismissive view of yoga as a physical exercise (Desai, 2004; Ergas, 2014; Feuerstein, 1998). Thus, they argue that through research, Western culture seeks to use yoga, meditation, and mindfulness to “fix” mental and physical health, attention, focus, and behavior problems in schools (Accardo, 2017; Cook-Cottone et al., 2017, 2019). The scholarly and practitioner understanding of yoga is that
the path works for those who practice all aspects – especially the foundational moral precept of non-violence (Brems et. al, 2015; Ergas, 2014; Hoyt, 2016; Hyland, 2016).

Ahimsa, or non-violence, is at the heart of all yoga, and scholars see this as essential for true contemplative practitioners in developing self-compassion internally and extending that compassion outward (Brems et. al, 2015; Ergas, 2014; Hartranft, 2003; Hoyt, 2016; Hyland, 2016). In this way, yoga practitioners are not meant to escape into an alternate reality, but rather, are encouraged to take their best self forward to make the world a better place (Ergas, 2014; Hartranft, 2003; Hoyt, 2016; Hyland, 2016). This original aim of yoga is lost when popular culture frames yoga as a trendy exercise routine and when researchers prescribe yoga to fix poor test scores in urban schools (Accardo, 2017; Brems et. al, 2015; Cook-Cottone et al., 2017, 2019; Ergas, 2014).

In addition to the challenge of quantifying and defining yoga and contemplative practice, the Western view of measuring program success has not accurately captured the benefits of these practices (Bamber & Schneider, 2020; Brems et. al, 2015). In this case, while physicians, psychologists, and academic advisors may recommend that college students try yoga to reduce stress and improve wellbeing, the existing research has relied on self-report surveys like the Perceived Stress Scale as evidence of program efficacy (Bamber & Schneider, 2020). While this type of data may show an improvement in mean perceived stress of a group, the numbers do not emphasize what makes a program successful and how individuals experience change on many levels.

**Measuring Perceived Stress.** Researchers have considered the Perceived Stress Scale (PSS) as a valid and reliable tool for measuring individual and group stress, but there are many issues with relying solely on self-report surveys (Bamber & Schneider, 2016; Beck et al., 2017;
Lutz et al., 2015). Participants can be influenced by their current mood while rating perceived stress instead of recalling the impacts of stress during the past month as instructed. They may also have reported higher perceived stress initially and then lower perceived stress as the semester progressed, either consciously or unconsciously, because they sought approval from their teacher. Additionally, researchers have debated the difference between “state” and “trait” aspects of stress/anxiety/mindfulness and how much an individual’s natural tendency affect results (Bamber & Schneider, 2016; Kishida et al., 2019; Lutz et al., 2015).

Researchers have explored the nuanced definitions between stress and anxiety on a neurobiological level, and also attempted to delineate whether some people are predisposed to experience higher stress and resulting anxiety (Daviu et al., 2019). This research is still an emerging field, and basic field researchers cannot determine whether an individual has a naturally higher stress response or if their stress is acute (Daviu et al., 2019). Thus, participants’ responses on self-report surveys, such as the PSS, may not be accurate indicators of whether the perceived stress is acute or chronic, or whether there is a predetermined high perception of stress threats (Kishida et al., 2019; Lutz et al., 2015). Additionally, researchers cannot conclude with any certainty that changes in perceived stress are the result of a specific intervention.

People live in complex environments with many possible factors that impact stress outside of the research intervention. They may experience an unexpected tragedy or acute illness that influences their perception of stress regardless of their involvement in a contemplative practice. Alternatively, participants may experience temporary good fortune and a momentary reduction in stress. While researchers can learn important baseline information from self-report surveys like the PSS, they will not be able to see the full story or determine efficacy. However, researchers often use changes in numeric data like stress scores as a gold standard in evaluating
programs. In this discussing the quantitative results of this study, I will share what changes in perceived stress could be important, and also the areas where the analysis lacks the necessary depth to explain the students’ full experience.

**Interpreting Quantitative Perceived Stress Scores**

During the quantitative phase of this study, the sample (n = 121) reported a statistically significant decrease in mean perceived stress between weeks 3 and 11 and weeks 7 and 11 of the semester-long yoga course. While this is a positive finding, these changes in perceived stress at the group level do not illustrate the pattern of changes for students who started the semester at various levels of stress and for those who did not complete all PSS surveys (see Figure 4.1). After I color-coded and graphed the participants’ individual perceived stress levels; I identified several patterns in the distribution of initial stress, the changes within each level, and the levels where participants were lost to attrition.

As I reviewed the changes in individual participants’ stress levels for each of the initial stress level groupings (i.e., low, low-moderate, high-moderate, and high), I made several interesting observations. For the low stress level participants, I was not surprised to see: (a) this group was the smallest number of students (n = 23), (b) their stress varied minimally across the semester, or (c) only four of these students did not complete all of the PSS surveys. I had predicted that the moderate stress level would be the largest, and therefore I split this into low-moderate and high-moderate to better examine subtle differences between those with a PSS below/above 20 which was close to the mean score before attrition (M = 20.59). These groups were still the largest, with n = 54 in the low-moderate and n = 67 in the high-moderate. As initial perceived stress increased, so did the variability in changes across the semester and the attrition from participants who did not complete one or both of the follow up PSS surveys. The group
with high initial stress (n = 28) was smaller than the moderate group, experienced high variability in perceived stress across the semester, and had the highest rate of attrition (39.3%). Given that so many students with high stress did not complete all the surveys, I could assume that they benefitted less from the course but there are many possible factors for these students. On the positive side, most students in the high stress category reported significantly less perceived stress by week 11. Additionally, I would emphasize again that the perceived stress numbers only tell part of the story. Whether or not the overall sample experienced a significant reduction in stress, or even if participants in one specific stress level documented less stress, I would still wonder about what made a difference for students whose stress increased or decreased dramatically during the semester-long course. I was only able to find the “how” and “why” information by reviewing the qualitative themes and then comparing these to the perceived stress scores for the smaller qualitative sample.

Illustrating Qualitative Reflection Themes

The participants shared their reasons for enrolling in Yoga 1 in initial reflections, their daily emotions in before and after practice journal entries, and their summative feelings about the course and their wellbeing in final reflections.

Initial Reflections. The primary theme that evolved from the initial reflections was that students were seeking out a scheduled time and space for self-care and stress reduction in daily life (Participants 4, 13, 16, 26, 36, 41, 74, 79, 94, 98, 103, 134, Initial Reflections). Several students also discussed how they had recently started to practice yoga online during the pandemic (Participants 13, 69, 78, 98, 152). Participants who had previously practiced yoga explained that they were unable to develop or maintain a consistent practice on their own, and enrolled in the course to have this time set aside during their busy days (Participants 4, 36, 41,
Researchers have cited time as a barrier to contemplative practice, in addition to cost, access, and qualified instructors, and the students were able to overcome those obstacles by taking this course as an elective (Bamber & Schneider, 2020; Marques, 2018).

Several students immediately perceived the yoga class as a safe and welcoming space (36, 93, 134, Initial Reflections). A core goal of contemplative practice programs is for the instructor to create this type of environment so that practitioners can relax and observe themselves non-judgmentally and with compassion (Kabat-Zinn, 2003). The principle of safe space is similar to Kaplan’s (2001) research on the need for restorative environments where people can just exist without excessive demands, and salutogenesis researchers have proposed that contemplative practice communities provide restorative environments (von Lindern et al., 2017). The welcoming classroom may have allowed students to share their emotions more freely before and after practice in their journals.

**Journals.** Participants described several main themes in their daily practice logs that are aligned with yoga philosophy including finding a sense of ease, supercharging, holding opposing forces, and preparing to tackle the day (all participants, Journals). The first two primary themes of finding a sense of ease and supercharging are also tied to current psychological research on emotions (Brown et al., 2021; Erbas et al., 2019).

**Emotions: Finding a Sense of Ease and Supercharging.** While students should obviously feel more relaxed after a yoga class, they described a wide range of “ease” and “supercharging” emotions that starkly contrasted to their pre-practice states (all participants, Journals). Their observations are interesting for two reasons: (1) the classes were relatively short in daily practice length and (2) researchers have found that most people can identify three main
emotions of happy, sad, and angry but lack the ability to discuss more detailed feelings (Brown, 2021). Researchers have proposed that when people can break down these three basic emotions more specifically, that they can then better regulate their emotional states and subsequent wellbeing (Barrett et al., 2001; Erbas et al., 2019).

During the Fall 2021 semester, there were 121 participants across eight course sections enrolled in this study. All sections were three credit hours per week with slight variations – three sections met three days per week for 50 minutes, four sections were held two days per week for 75 minutes, and one section met one day each week for 165 minutes. There was no statistically significant difference in perceived stress scores between the sections based on times or days, and I did not note any difference in qualitative data when I reviewed based on sections. Since classes included a lecture component, the sections that met three days per week would only have 30-45 minutes for practice and students still described dramatic changes in mood and energy (all Participants, Journals). This improvement is important when considering how much yoga is necessary for individuals to experience the benefits. The consistency of practice and depth of yoga knowledge may be more important than the duration of each class.

The students used a multitude of words to encompass their feelings after practice, and these descriptors developed into the sub-themes of feeling happy, lighter, recovered, balanced, and peaceful within the main theme of finding a sense of ease (all Participants, Journals). While participants most frequently discussed happiness, they often paired this with other positive feelings in their journals (Participants 13, 37, 41, 58, 75, 78, 84, 99, 103, 109, 134, 138, 152, Journals). The participants also expressed a variety of post-practice emotions under the main theme of supercharging, and these included feeling energized, awake, capable, and rejuvenated (Participants 12, 13, 16, 36, 37, 39, 41, 69, 74, 75, 78, 79, 84, 98, 99, 103, 105, 109, 138, 152,
As Brown (2021) recently discussed, researchers who study emotions have found that individuals have a limited ability to describe emotions at this level (Barrett et al., 2001; Erbas et al., 2019). Thus, the participants in this study either came into the course with a greater emotional maturity or they somehow learned or felt comfortable enough to express themselves in their practice journals. This finding is important because when people are able to observe and understand their feelings, they are better able to cope with negative states according to both yoga scholars and emotions researchers (Barrett et al., 2001; Erbas et al., 2019).

**Finding Comfort: Holding Opposing Forces.** Yoga scholars and emotion researchers have also noted that people find the concept of having seemingly contradictory emotions at the same time, and I observed this theme of holding opposing forces in participants’ journals. Participants commonly paired post-practice reports of relaxation with the opposite sensations of being energized, and also categorized energy as “good” versus “bad” (Participants 41, 75, 84, 98, 152, Journals). They also described holding opposing forces in different areas of their self. For example, Laura noted feeling better physically after practice, but mentally clogged (Participant 93, Week 12 Journal). Brown (2021) discussed that this type of paradox that “challenges us to straddle the tension of two conflicting elements and recognize that they can both be true” is critical for emotional wellbeing (p. 82). Among yoga scholars there is the understanding that when practitioners experience union between mind and body and connection to the greater world, they find space for all emotions and see the link between these opposing forces (Birch, 1995; Iyengar, 1999).

**Sense of Coherence: Preparing to Tackle the Day.** As participants released the weight of stress and related fatigue, they increased their feelings of positive wellbeing and wrote about the culminating theme of being prepared to “tackle” the rest of the day. Students wrote about this
readiness for daily life in alignment with Antonovsky’s (1979) sense of coherence construct that found improved wellbeing when people feel the world makes sense, that life is meaningful, and that tasks are manageable. Some participants directly connected their post-practice feelings of being more awake and energized to being “excited to see what the day brings” and being “ready to set goals for the week” (Participants 105, 152, Journals). Another student also talked about the shift from “worry” to feeling “calm, collected, aware, and prepared (Participant 58, Week 2 Journal). As noted earlier with the participants’ change in mood and energy, this ability to change from anxiety and overwhelm into an eagerness for life is a striking contrast given the short time spent in yoga practice. This finding supported a main objective in this course for students to learn how to develop a short self-practice to meet their energy needs. If students can learn to integrate practice into daily life, then they may be able to continue to improve wellbeing over time. Overall, the qualitative themes added rich description to the quantitative changes in perceived stress, and I also directly compared these two data sources.

**Comparing Perceived Stress to Documented Stress and Wellbeing**

Prior to coding and analyzing the data, I had hypothesized that there would be clear differences in how students talked about their stress and emotions based on their perceived stress levels. For example, I thought that I would be able to identify the participants with high perceived stress because they would talk about their stressors and negative impacts more frequently. My hypothesis was incorrect, and all students (with one exception, Participant 84, as mentioned previously) consistently talked about having high stress in initial reflections, journal entries, and final reflections. I was particularly surprised that students with the lowest perceived stress still wrote about having high stress (Table 4.5). All participants also described specific ways that they benefitted from the course, and even the student who reported “being happy and
stress-free all semester” described the yoga class as “lifechanging” (Participant 84, Final Reflection).

While researchers may use the PSS to document a change in group stress levels during an intervention, the individual experiences are very important to understand in greater detail. When just one student finds a sense of relief in today’s chaotic world, that may be enough reason to continue a program. Of course, there were more than one or even a few students who found peace and productivity through yoga and contemplative practice. The overall mean perceived stress score decreased significantly across the semester, and all participants in the qualitative sample shared specific ways that they proactively changed their outlook and behaviors as a result of the course (all participants, Final Reflections). While their experiences provide a rationale for expanding contemplative practice programs, I also need to acknowledge the limitations in this study to improve future research.

**Limitations**

In Chapter I, I noted specific limitations with this study design including potential teacher/researcher bias, participant bias, self-report survey data, and the lack of a control group. I also encountered challenges within methodology related to attrition and removal of planned focus groups. As a result of these limitations and the non-representative sample, I cannot claim that the benefits in this can be generalized to all students in higher education. All researchers experience limitations and acknowledgment of these factors can improve future work in their field.

**Study Design Limitations**

I chose to study a specific course with a comprehensive curriculum at a predominantly white mid-Atlantic university, and I understood that this decision would have inherent
limitations. Since I served as both a teacher and researcher in this study, I may have unconsciously influenced the students or results. Students may also respond differently when they know their class is being studied. Finally, since I did not use a control or comparison group, students may have benefitted equally to another course besides yoga. As I discuss the limitations in greater detail, I will also share how I minimized the impact of these choices in the study design.

**Teacher as Researcher.** My dual role as teacher and researcher was a benefit in some ways, but also a source of potential bias in other areas. I had a long history of yoga and teaching experience, and I also had direct knowledge of several participants who were my students. Additionally, these students were aware that I was conducting research on the course. Although I did not discuss the research regularly in class, my very presence in the classroom could have impacted how students learned in the three sections that I taught. Also, there is always a possibility that a teacher/researcher may unconsciously view students who participate differently. I followed best practices by deidentifying participants and assigned numeric identification and pseudonyms to their work to prevent this bias.

**Participant Bias.** In addition to my potential bias as both teacher and researcher, students may also have responded differently knowing that I was potentially using their reflective assignments as data. They may have enrolled in the study to gain approval despite assurances that participation would not impact their grades. While students may have unconsciously responded in a biased manner, there were no indications of this in the perceived stress data or the reflective data. Participants did not reference the study in their work or during classes, and their perceived stress scores changed at reasonable levels.
**Self-report Survey Issues.** Researchers consider the Perceived Stress Scale valid and reliable, but there are many controversies surrounding self-report surveys (Bamber & Schneider, 2016; Lutz et al., 2015). While the PSS asks participants to base their answers on their stress level across the past month, their answers are likely more reflective of their more immediate mood on a given day. As I previously discussed in this chapter, researchers have also questioned whether these scales measure the respondents’ innate emotional tendency or their current level of stress (Bamber & Schneider, 2016). Additionally, some students may not respond truthfully because they know their responses will be read or because they do not want to acknowledge that they are affected by a high level of stress. I recognized this limitation prior to the study, and selected a mixed methods approach to fill in the gaps of self-reported data through qualitative analysis.

**Methodology Limitations**

I encountered a few limitations related to the study methodology including attrition and response bias and the removal of planned focus groups. I forecasted that these issues might arise, and I did attempt to avoid them. Researchers have often noted issues with attrition and sample participation as this is a common challenge of study design (Creswell & Guetterman, 2019).

**Attrition and Response Bias.** As I discussed in detail in Chapter IV, 30% of participants who consented during the first PSS missed one or both follow-up surveys. I noted similar attrition issues when I conducted a pilot study in Spring 2021, so I offered a $20 gift card raffle as an incentive for students who completed each perceived stress survey in this Fall 2021 study but that was not successful. As I detailed in Chapter IV, there are many contributing factors that lessen the impact of this loss, and Creswell and Guetterman (2019) noted that a response rate over 50% is excellent within survey design.
However, I do see that there is potential response bias because the majority of attrition occurred among students with higher perceived stress levels (see Figure 4.1). Bamber & Schneider (2016) conducted a systematic review of 40 studies that incorporated mindfulness-based meditation as an intervention to reduce stress and anxiety in college students, researchers cited high attrition as a limitation in 13 of these studies. Yet, I was unable to locate any conclusive reasons for the high attrition rates and potential response bias in these studies. However, since college students experience mental health concerns with resulting poor class attendance and decreased motivation, researchers may logically conclude that students with the highest levels of stress may be the least likely to stay enrolled and follow through within a research study.

**Removal of Planned Focus Groups.** I initially planned to conduct focus groups from students within the qualitative sample (n = 27) during week 13 of this study. However, I had indicated that these focus groups were optional on the first survey, and many students opted out. Additionally, the qualitative sample was small, and I further divided that group by stress level, so the potential pool was even smaller. Ultimately, only three participants were able to meet via zoom at a common time, and one could not attend as a result of a last minute schedule conflict. Other participants were available at various times or unavailable due to illness. After conducting the single focus group, I determined that the participants did not share any new information and chose not to include this limited data in the study. However, they did share very openly in their written work, and future research might incorporate a comparison of students’ preference for reflection about emotions and contemplative practice in writing as opposed to verbal means.
Overall Generalizability

This study reflects how a specific group of students experienced a very particular yoga course at a predominantly white institution during a specific time context, and thus, cannot be generalized to all yoga courses in higher education. While the student demographics were representative of the university population, the overall profile still lacked diversity (see Table 4.1). The faculty teaching this course were experienced practitioners themselves and had integrated all aspects of yoga philosophy into their daily lives. Two of the three instructors were credentialed with Yoga Alliance at the highest level of Experienced Registered Yoga Teacher - 500 Hours (E-RYT 500) and Yoga Alliance Continuing Education Provider (YACEP), and the third instructor was an Experienced Registered Yoga Teacher – 200 Hours (E-RYT 200). Teachers earn the “experienced” designation after completing over 1,000-2,000 hours of teaching time once they complete training through a Registered Yoga School. The combined knowledge and experience of the faculty may have contributed to an exceptionally high-quality program, and the results may have been different with less experienced instructors.

The time context of the COVID-19 pandemic also limited generalization as did the situation of students returning to in-person instruction after over a year of remote learning at the university. I observed both positive and negative aspects that occurred with this research during such a specific time. Students may have needed the yoga course even more than in pre-pandemic times, but the new struggles of masking during physical activity and practicing in a space without climate control or privacy may have detracted from their ability to benefit from the yoga class.

This study was not designed with the intent to generalize the results on a broad level, but rather to examine closely to potential impacts of a high-quality program during an unprecedented...
time. However, the conclusions from this study can inform future research and offer a starting foundation for an evidence-based yoga curriculum.

**Implications in Higher Education**

As I discussed in detail throughout Chapter I and II, college students have been struggling with mental health issues for decades that have worsened even more during the COVID-19 pandemic. They are in dire need of programming that encourages them to find a safe space within a chaotic world and to learn coping skills. In this study, today’s college students reported that they feel the fatigue and heaviness of stress, overwhelm, and anxiety. When they had a scheduled time to practice yoga regularly, they experienced decreased levels of perceived stress and improved wellbeing. As they increased the frequency of their contemplative practices, students reported greater feelings of ease, becoming supercharged, able to hold opposing forces, and ready to tackle the day. These young adults are seeking out time for self-care, and higher education can support their desire for healing by increasing contemplative practice opportunities.

Based on the results of this study, I recommend that universities consider expanding yoga and contemplative practice coursework as part of the general education curriculum and through first-year experience courses as one way to improve mental health and prevent serious emotional crises among college students. Additionally, I would strongly encourage that administrators build quality yoga programs that incorporate a comprehensive curriculum including moral and ethical precepts, breathwork, meditation, mindfulness, yoga history and philosophy for an effective mind/body program. When these programs are added to the regular curriculum, a more diverse group of students have greater access to yoga without the barriers of time, cost, and place (Bamber & Schneider, 2020; Marques, 2018; Neumark-Sztainer et al., 2020; Spadola et al., 2017). Additionally, students who fear the stigma of traditional counseling services based on
identity may find contemplative practice courses a more palatable choice (Marques, 2018; Neumark-Sztainer et al., 2020; Spadola et al., 2017). Yoga as a first-year experience course is one potential way to introduce a large, diverse group of students to contemplative practice.

**First-Year Experience**

Many universities have started to offer first-year experience courses to better transition students to the college environment. Mahfouz et al. (2018) found preliminary evidence that an eight-session mindfulness-based program supported better stress management among first-year students and recommended that these voluntary classes would have more impact as part of a required first-year curriculum. A set of courses on mind/body health including yoga and contemplative practices would provide an opportunity for students to improve their coping skills while adjusting to the loss of their existing support network as they leave their parental homes (Bamber & Schneider, 2016; Mahfouz et al., 2018).

Researchers have identified that students encounter new obstacles during this transition to college and often resort to maladaptive responses including excessive drinking and skipping classes (Bamber & Schneider, 2016; Mahfouz et al., 2018). First-year students are more likely to leave college early as a result of poor grades and other consequences of unmitigated stress (Bamber & Schneider, 2016; Mahfouz et al., 2018). If students are instructed in appropriate ways to manage their stress and adjust more easily to college life, colleges may be able increase student engagement and retention (Bamber & Schneider, 2016; Mahfouz et al., 2018).

**General Education**

Colleges may offer yoga as physical education elective which limits the audience and aims of the course. Many universities no longer have a physical education requirement so that students can maximize their budget by only taking courses within their major. Additionally,
students may not benefit as greatly if yoga is only taught as an exercise class without the fundamental teachings that lead to self-compassion (Desai, 2004; Ergas, 2014; Feuerstein, 1998; Villate, 2015). However, yoga can be taught as a comprehensive course within a health or contemplative studies general education track and maintain the authentic teachings for a holistic approach.

Researchers have also suggested that yoga and mindfulness are important skills for future professionals in “helping careers” and studied the efficacy of contemplative practice for these undergraduate students to prevent future compassion fatigue (Beck et al., 2017; Beer et al., 2015; Brems et al., 2015). While future healthcare professionals could certainly benefit from contemplative practice as part of their degree programs, the overall student body is in need of evidence-based methods for addressing stress-related trauma as a result of the COVID-19 pandemic (Reger et al., 2020; Bavel et al., 2020). If yoga is more visible as a general education offering, more students may be able to access coping skills.

**Recommendations for Future Research**

Yoga and contemplative practices have become increasingly popular in education, but the research base is relatively new. I concur with other researchers that there are many possibilities to study in this area. After conducting this study, I would specifically recommend that yoga education researchers increase their rigor and methods by incorporating control/comparison groups, a variety of outcome measurement scales, physiological measures of stress, long-term follow up data, and programming for faculty and staff.

**Control/Comparison Groups**

While the purpose of this study was an in-depth examination of the student experience in one course, I propose that a natural next step would be to compare the yoga course to other
courses to rule out confounding data and assess efficacy of alternate methods. Researchers could compare the changes in perceived stress among students enrolled in a positive psychology course similar to Dr. Santos’ *Psychology and the Good Life* and a yoga or contemplative practice course. Since many people enjoy yoga simply for physical fitness, researchers could also compare stress outcomes for other exercise-based courses to determine the role of movement alone in reducing stress (Cramer et al., 2016; Wong, 2018). A few researchers have studied different outcomes for students enrolled in various contemplative practice styles as well (i.e., meditation versus mindfulness versus yoga), but I propose that this comparison misses the point that individuals will benefit most from their preferred style of practice (Falsafi, 2016).

**Measurement Scales**

In this study, I focused on perceived stress for comparison of quantitative data with qualitative reflections because stress is ubiquitous and an easily defined construct. However, researchers have used other scales to measure changes in yoga practitioners. Future researchers assessing the efficacy of yoga in higher education might use a combination of self-report surveys in isolation or in conjunction with the PSS. While there are a variety of validated scales that researchers could use to measure mindfulness or quality of life changes, I recommend assessing the development of self-compassion as an important contemplative practice outcome (Ergas, 2014; Neff, 2002).

Neff (2002) developed the Self-Compassion Scale to connect the Buddhist construct with modern psychology and validated this scale among undergraduate students. Since scholars have criticized yoga research that lack compassion development as an outcome, future research can incorporate the SCS to ensure a focus on this essential element (Beck et al., 2015; Ergas, 2014).
Self-compassion is also critical for personal mental health and empathy towards others (Beck et al., 2015; Neff, 2002).

**Physiological Measures of Stress**

In addition to quantitative data from self-report surveys, researchers have assessed physiological measures including serum cortisol and lipids, brain imaging, and heart rate variability in yoga research (Bamber & Schneider, 2016; McEwen & Morrison, 2013; McEwen, 2017; van Aalst et al., 2020). However, I did not find any studies that incorporated qualitative design to explain or support the findings from physiological assessment. Research that combines self-report surveys, physiological measures, and qualitative inquiry would offer the most complete method for studying the complex nature of yoga.

**Follow Up Data**

While researchers have speculated that individuals will continue to benefit from long term contemplative practice, I am not aware of any studies with a follow up component. As yoga faculty, I have received emails from past students who shared how much the course enhanced their wellbeing but this is anecdotal and may be isolated to a few students. Research on how yoga affects future happiness, career choice, and/or stress management could also support increased visibility for yoga within higher education.

**Faculty/Staff**

While some researchers have targeted contemplative interventions towards faculty and staff in higher education, there is minimal research in this area (Beer et al., 2015; Page & Margolis, 2017; Schussler et al., 2018; Weare, 2019). In particular, there is a lack of knowledge on how the reflective practices of faculty and staff might affect students (Beer et al., 2015; Weare, 2019). When researchers have explored contemplative practice among faculty and staff,
the interventions are typically short-lived, and faculty/staff may not have achieved a truly reflective practice themselves in order to share authentically with students (Beer et al., 2015; Weare, 2019). Educators may also benefit from enhanced self-care and stress management from contemplative practice, and their enhanced wellbeing could benefit students (Schussler et al., 2018; Weare, 2019). I recommend that future research investigate the impacts of teachers’ reflective practices on their teaching and student outcomes.

Conclusion

College students have been suffering with stress and poor mental health for decades, and the COVID-19 pandemic has shaken the unstable foundation of daily life even more in the past two years (ACHA, 2021; Van Bavel et al., 2020; Zhai & Du, 2020). Young adults are carrying a heavy burden to forge a new path, and many have experienced a great deal of trauma (ACHA, 2021; Van Bavel et al., 2020). When students are weighed down and overwhelmed by stress, their nervous systems are on a constant roller coaster between hyper-arousal and hypo-arousal, and they cannot access the resilient and calm state to learn new material (Leitch, 2017; van der Kolk, 2015). This toxic level of stress impacts all areas of college students’ daily lives, but they can learn to control their nervous system and create wellbeing (Leitch, 2017; van der Kolk, 2015).

Through yoga and contemplative practice courses, students can access a restorative environment where they can find temporary respite and learn coping skills to better respond to stressors in daily life (Kaplan, 2001; von Lindern et al., 2017). When students spend time in restorative environments, they may be able to strengthen their sense of coherence (e.g., the extent that the world makes sense and life is manageable and meaningful) with little effort. Antonovsky
(1996) proposed that public health programs should use the sense of coherence as a guiding principle for supporting communities and individuals in creating health.

In conclusion, this study provided evidence that students can improve their psychological wellbeing through yoga and contemplative practice even in trying times. Additionally, when students have access to these courses within their regular schedule, they overcome common barriers of time and expense. Students who may avoid traditional counseling due to fear of stigmatization may find yoga a more acceptable way to find relief from stress (Neumark-Sztainer, et al., 2020; Spadola et al., 2017). Since the field of research on yoga in higher education is still emerging, future studies might incorporate more comparison and control groups, a variety of scales to measure wellbeing, and physiological assessments. There is sufficient evidence that yoga and contemplative practice courses offer a potential strategy for improving college students’ mental health. Higher education administrators may want to consider expanding yoga and contemplative practice courses to teach many students basic stress management skills, while also ensuring that comprehensive mind/body courses are taught by educators who are experienced, reflective practitioners for maximum benefit.
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Appendix A: Pilot Study IRB Approval Letter

Feb 1, 2021 7:50:45 AM EST

To: Lori Klein
Nutrition, Literacy

Re: Expedited Review - Initial -IRB -FY2021-59 College student experiences with remote yoga instruction during a global coronavirus pandemic: A pilot study

Dear Lori Klein:

Thank you for your submitted application to the WCUPA Institutional Review Board. Since it was deemed expedited, it was required that two reviewers evaluated the submission. We have had the opportunity to review your application and have rendered the decision below for College student experiences with remote yoga instruction during a global coronavirus pandemic: A pilot study.

Decision: Approved

Selected Category: 7. Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

Findings:

Research Notes:

Internal Notes:

Sincerely,

WCUPA Institutional Review Board

IORG#: IORG0004242
IRB#: IRB00005030
FWA#: FWA00014155
Appendix B: Recruitment Script

My name is Lori Klein, and I would like to share an opportunity to participate in a research study investigating the potential benefits of a remote yoga class on stress management during a global pandemic. This study is being conducted by myself, Lori Klein. This study has been reviewed and approved by the WCU Institutional Review Board (IRB) protocol #IRB-FY2021-212. If you would like to participate in this study you will agree to the consent form in the Qualtrics survey that I/your instructors will share next week, and then you will complete typical course assignments and participate in class as usual. Your responses on assignments including a perceived stress survey completed three times during the semester, daily journals, and written reflections will be used as data for this study, but your grade will not be impacted by participation in this study. Your name will be removed from all assignments and documents will be stored on a password protected computer or in a locked file cabinet.

You will be asked to complete a survey in class next week to obtain your permission to use information from your class assignments as part of this study. The survey will also ask if you are interested in participating in an optional focus group later in the semester to discuss your experiences in yoga class, but only a few participants will be randomly selected to participate in the 30–60-minute focus group.

If you would like more information or if you have any questions please contact me, Lori Klein, lklein@wcupa.edu. Agreement to be contacted or a request for more information does not obligate you to participate in the study.

Thank you for considering this research opportunity!
Appendix C: Recruitment Follow Up Email Letter

Dear Yoga I students:

As you are currently enrolled in Yoga I for this upcoming Fall 2021 semester, I am writing to let you know about an opportunity to participate in a research study investigating the potential benefits of the Yoga 1 course on stress management during a global pandemic. This study is being conducted by myself, Lori Klein, an [redacted]. This study has been reviewed and approved by the WCU Institutional Review Board (IRB) protocol #IRB-FY2021-212. If you would like to participate in this study you will agree to the consent form in the Qualtrics survey that I/your instructors will share next week, and then you will complete typical course assignments and participate in class as usual. Your responses on assignments including a perceived stress survey completed three times during the semester, daily journals, and written reflections will be used as data for this study, but your grade will not be impacted by participation in this study. Your name will be removed from all assignments and documents will be stored on a password protected computer or in a locked file cabinet.

You will be asked to complete a survey in class next week to obtain your permission to use information from your class assignments as part of this study. The survey will also ask if you are interested in participating in an optional focus group later in the semester to discuss your experiences in yoga class, but only a few participants will be randomly selected to participate in the 30–60-minute focus group.

If you would like more information or if you have any questions please contact me, Lori Klein, [redacted] Agreement to be contacted or a request for more information does not obligate you to participate in the study.

Thank you for considering this research opportunity,

Lori Klein, MPH
Appendix D: Modified Perceived Stress Survey with Informed Consent

**Project Title:** Yoga, stress, and college students during the COVID-19 pandemic: An explanatory sequential mixed methods study

**Investigator(s):** Lori Klein; Heather Schugar

**Key Information:** Your consent is being sought for a research study. This study has been reviewed and approved by the WCU Institutional Review Board (IRB) IRB-FY2021-212. Your participation is voluntary and you are under no obligation to participate. The purpose of this research is to better understand the role of yoga courses in college students’ stress management during a global pandemic. The time expected for your participation is 30-60 minutes if you are selected to complete an optional focus group in the second half of the semester. A small number of students will be randomly selected and asked to give feedback in optional focus groups with 5-8 participants via Zoom that will be recorded, transcribed, and then deleted. All other components of this study are part of the regular class assignments including use of journals, questionnaires, and reflection. There is a minimal risk of mild anxiety while answering questions in the optional focus group process. Participants (and all students in Yoga 1) will be offered campus resources such as referral to the counseling center in the event of that a past trauma is triggered by personal reflection. There is potential benefit that this research will help inform future research on yoga. The research project is being done by Lori Klein as part of her doctoral dissertation to determine how yoga courses affect the stress management of college students during a global pandemic. An additional interest is to identify student's perceived benefits of yoga class. If you would like to take part, West Chester University requires that you agree and electronically consent. You may ask Lori Klein any questions to help you understand this study. If you do not want to be a part of this study, it will not affect any of the services you receive from [insert information]. If you choose
to be a part of this study, you have the right to change your mind and stop being a part of the study at any time.

1. **What is the purpose of this study?** This study seeks to understand the role of yoga courses delivered via remote instruction in college students’ stress management during a global pandemic. In addition, this study will explore student enrollment in yoga classes during a pandemic, and how perceptions of yoga may change across the semester.

2. **If you decide to be a part of this study, you will be asked to do the following:** Complete an optional focus group if selected. All other components of the study are required class assignments, including use of journals, questionnaires, and reflections. For the required assignments, you will be asked to provide your consent to use your data. This study will take 30-60 minutes of your time if you are selected for and choose to participate in the focus group.

3. **Are there any experimental medical treatments?** No

4. **Is there any risk to me?** Possible risks or sources of discomfort include: discomfort with content of questions, mild anxiety when answering questions or triggering of past trauma through self-reflection. Participants will be offered resources in the event of that a past trauma is triggered by personal reflection. If you become upset and wish to speak with someone, you may speak with Lori Klein or Heather Schugar. If you experience discomfort, you have the right to withdraw at any time.

5. **Is there any benefit to me?** There are no direct benefits to you as part of your participation in this study. However, the results of this study may benefit others by adding to the research on yoga.

6. **How will you protect my privacy?** Your records will be private. Only Lori Klein, Heather Schugar, and the IRB will have access to your name and responses. Your name will not be used in any reports. Records will be stored on a Password Protected File/Computer. Data will be anonymized, and
all student information will be kept confidential. Records will be destroyed three years after study completion.

7. **Do I get paid to take part in this study?** No, but there is a raffle for $20 Wawa gift card for completing each of the three perceived stress surveys in class.

8. **Who do I contact in case of research related injury?** For any questions with this study, contact:

   - □ **Primary Investigator:** Lori Klein at [REDACTED]
   - □ **Faculty Sponsor:** Heather Schugar at [REDACTED]

9. **What will you do with my Identifiable Information/Biospecimens?** Not applicable. For any questions about your rights in this research study, contact the [REDACTED]

Please confirm whether you consent or do not consent to participate in this study.

☐ I consent AND confirm that I am over 18 years of age AND have not previously enrolled in Yoga 1

☐ I do not consent OR I am under 18 years of age OR I am auditing Yoga 1

I consent to participating in the research study as described in the attached document.

- ☐ I consent AND confirm that I am over 18 years of age AND have not previously completed Yoga 1 (1)

- ☐ I do not consent OR I am under 18 years of age OR I am auditing Yoga 1 (2)

Please type your name which will be kept private and confidential.
Please complete the questions on perceived stress regardless of whether or not you are participating in the study. Your answers will not be included unless you consented above, but are still part of the class assignment.

In the last month, how often have you been upset by something that happened unexpectedly?

- [ ] Often (1)
- [ ] Fairly Often (2)
- [ ] Sometimes (3)
- [ ] Almost Never (4)
- [ ] Never (5)

In the last month, how often have you felt that you were unable to control the important things in your life?

- [ ] Often (1)
In the last month, how often have you felt nervous and “stressed”?

- O Often (1)
- O Fairly Often (2)
- O Sometimes (3)
- O Almost Never (4)
- O Never (5)
In the last month, how often have you felt confident about your ability to handle your personal problems?

- Often (1)
- Fairly Often (2)
- Sometimes (3)
- Almost never (4)
- Never (5)

In the last month, how often have you felt that things were going your way?

- Often (1)
- Fairly Often (2)
- Sometimes (3)
- Almost Never (4)
• ○ Never (5)

In the last month, how often have you found that you could not cope with all the things that you had to do?

• ○ Often (1)

• ○ Fairly Often (2)

• ○ Sometimes (3)

• ○ Almost Never (4)

• ○ Never (5)

In the last month, how often have you been able to control irritations in your life?

• ○ Often (1)

• ○ Fairly Often (2)
In the last month, how often have you felt that you were on top of things?

- •  ○  Sometimes (3)

- •  ○  Almost Never (4)

- •  ○  Never (5)

In the last month, how often have you been angered because of things that were outside of your control?

- •  ○  Often (1)

- •  ○  Fairly Often (2)

- •  ○  Sometimes (3)

- •  ○  Almost Never (4)

- •  ○  Never (5)
In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?

- Often (1)
- Fairly Often (2)
- Sometimes (3)
- Almost Never (4)
- Never (5)
In the past month, how often have you practiced meditation?

- Never (5)
- Daily (1)
- 4-6 times a week (2)
- 2-3 times a week (3)
- Once a week (4)
- Never (5)

In the past month, how often have you practiced mindfulness?

- Daily (1)
- 4-6 times a week (2)
- 2-3 times a week (3)
In the past month, how often have you practiced yoga?

- • ○ Daily (1)
- • ○ 4-6 times a week (2)
- • ○ 2-3 times a week (3)
- • ○ Once a week (4)
- • ○ Never (5)

I am willing to participate in a 30-60 minute focus group via Zoom at my convenience to discuss my experience in yoga class if randomly selected.

- • ○ Yes (1)
• □ Maybe (2)

• □ No (3)

How many hours do you currently work in a week?

• □ 0-10 (1)

• □ 11-20 (2)

• □ 21-30 (3)

• □ 31-40 (4)

• □ 41+ (5)

What is your academic ranking?

• □ First year (1)
- Sophomore (2)

- Junior (3)

- Senior (4)

- Graduate/Second Degree (5)

What is your age?

- Under 18 (1)

- 18 - 24 (2)

- 25 - 34 (3)

- 35 - 44 (4)

- 45 - 54 (5)
• ○ 55 - 64 (6)

• ○ 65 - 74 (7)

• ○ 75 - 84 (8)

• ○ 85 or older (9)

Do you identify as Hispanic or Latinx?

• ○ Yes (1)

• ○ No (2)

• ○ Prefer Not to Answer (3)

How do you describe your race or ethnicity?

• ○ White (1)
• ○ Black or African American (2)

• ○ American Indian or Alaska Native (3)

• ○ Asian (4)

• ○ Native Hawaiian or Pacific Islander (5)

• ○ Self-describe (6) __________________________________________________

What is your gender?

• ○ Male (1)

• ○ Female (2)

• ○ Non-binary (3)

• ○ Self-describe (4)__________________________________________
•  ○  Prefer Not to Answer (5)
Appendix E: Initial Reflection Questions

Please answer the following questions in 2-4 paragraphs total with complete sentences.

1. What are some of the reasons that motivated you to sign up for Yoga 1?

2. What do you already know about yoga?

3. What are your intentions and goals for yoga class this semester?

4. What is your experience of yoga during the first week of class?
Appendix F: Final Reflection Questions

1. What did you enjoy learning about in Yoga?
2. How did the physical practice feel?
3. What improvements did you have on the fitness assessments?
4. What improvements did you notice on symptoms of stress?
5. Did any of your symptoms of stress completely disappear?
6. What changes did you notice in your energy level on yoga class days?
7. Which of the yamas did you start practicing?
8. Which of the niyamas did you start practicing?
9. What lifestyle changes did you make to support wellness?
10. What other improvements in the dimensions of wellness did you experience?
11. When have used yogic breathing outside of class? How did it help?
12. What do you feel has been the most beneficial aspect of this class for you?
13. What was your favorite part of class and why?
14. What was your least favorite part of class and why?
15. Will you continue to practice yoga? How?
Appendix G: IRB Approval

Jun 29, 2021 12:42:52 PM EDT

To: Lori Klein Nutrition, Literacy

Re: Expedited Review - Initial - IRB-FY2021-212 Yoga, Stress, and College Students During the COVID-19 Pandemic: An Explanatory Sequential Mixed Methods Study

Dear Lori Klein:

Thank you for your submitted application to the WCUPA Institutional Review Board. Since it was deemed expedited, it was required that two reviewers evaluated the submission. We have had the opportunity to review your application and have rendered the decision below for Yoga, Stress, and College Students During the COVID-19 Pandemic: An Explanatory Sequential Mixed Methods Study.

Decision: Approved

Selected Category: 7. Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

Sincerely,

WCUPA Institutional Review Board

IORG#: IORG0004242 IRB#: IRB00005030 FWA#: FWA00014155