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## **Thesis Summary**

The goal of this thesis was to create and implement initiatives that encourage University of South Carolina students to spend more time in nature in order to promote their mental well-being. As the pandemic continues and students' lives become even more stressful, I believe it is important that universities provide students with as many resources as possible to promote mental well-being. To assess students' opinions about the connection between nature and mental well-being and about possible wellness events, a survey was sent to the student body. The two most popular wellness events from that survey were implemented in the Fall 2021 semester.

**Abstract**

In recent years, there has been a drastic spike in diagnosed mental illnesses and many people, including students, are reporting problems about their overall mental well-being (National Institute of Mental Health [NIMH], 2021). Furthermore, college students are experiencing unprecedented levels of stress, especially from the ongoing pandemic, leading to an increase in mental health disorders (Meredith et al., 2020). Scientists have known for years that there are numerous positive health-related effects that occur as a result of spending time in nature, one of which is a better mental state (Bratman, 2012). Therefore, the main purpose of this thesis is to increase awareness about the connection between nature and mental well-being by developing specific programs on-campus and at Congaree National Park, tailored towards college students.

## Introduction

In recent years, there has been a drastic increase in mental health problems and mental illness diagnoses (NIMH, 2021). For example, there has been a 13% increase in mental health conditions over the last decade worldwide (Volkov, 2019). Moreover, it is expected that the ongoing pandemic will only exacerbate these issues and further impact one's overall mental well-being. Mental well-being is a multidimensional term that aims to describe one's overall mental state, not just the presence or absence of mental illness. For example, one's sense of fulfillment, the ability to cope with stress, and the ability to respond appropriately to adverse events all are encompassed by the term "mental well-being" (Houlden et al., 2018).

One possible explanation that may explain why we are seeing an increase in mental health problems is that modern society has disconnected from nature, as a result of urbanization. Overcrowded cities, air pollution, lack of personal space, and nearly everything that we view as "modern" can be reasons why there has been a drastic increase in diagnosed mental health disorders in recent years (Maller, 2006). Some organizations are trying to combat this by designating green spaces and creating small parks, but that is not enough. The National Park Service (NPS) has the potential to play a critical role in reversing this trend. By developing and implementing mental wellness initiatives, they not only increase park attendance but also create a long-lasting positive impact. The NPS has recently formulated and implemented programs that can be used to promote overall well-being. Their *Healthy Parks Healthy People 2018-2023* serves as the core of each park's wellness initiatives (US, 2018). Although there is a particular emphasis on physical health, I believe the use of parks to promote mental health is just as important.

Evidence has shown that immersing oneself in nature leads to better human cognitive function and mental health (Bratman, 2012). In fact, spending as little as 10 minutes outside can significantly improve the mental well-being of college students (Meredith et al., 2020). Although several psychological phenomena can explain this, the focus of my project is to use this knowledge and evidence to develop and implement initiatives at Congaree National Park that promote mental well-being among college students. Depending on the success of these programs, it is my intent to implement similar programs at the regional or national level in collaboration with the National Park Service.

I chose to specifically focus on college students because they are experiencing unprecedented levels of stress and an increasing rate of mental health disorders. According to an article originally published in *Academic Psychiatry*, approximately 12% of college students suffer from a diagnosed anxiety disorder and approximately 10% suffer from a depression disorder (Pedrelli et.al, 2015). However, one does not need to have a diagnosed mental disorder to still feel anxious, depressed, hopeless, etc. A recent study published by the American Psychological Association states that 41.6% of college students experience anxiety-like symptoms and 36.4% experience depression-like symptoms (American Psychological Association [APA], 2013). As the pandemic continues, college students are more likely to face stressful situations, further contributing to an already existing mental health crisis amongst this target population. It can therefore be assumed that the true percentage of college students who have anxiety and/or depression disorders greatly exceeds 12% and 10%, respectively. By creating these initiatives, I hope to provide an outlet that is cost-effective, enjoyable, and can be utilized almost everywhere, not just at the National Parks.

## **Methodology**

Like most public health initiatives, I followed the generalized planning process. The first step was to assess the needs of the priority population (college students). Then, I set goals and objectives that guided me throughout the entire process. Next, I developed two initiatives that would be ready to be implemented at Congaree and on-campus by November and December. Finally, I evaluated my results by looking at the success of the programs, participants' feedback, etc. A more in-depth description of how each step was accomplished is given below.

The first step towards completing my thesis was to further research my topic of interest and look for evidence-based initiatives by conducting a literature search across several databases. My goal was to utilize the most recent scientific findings to create programs that promote mental well-being. To assist me in this endeavor, employees from Congaree National Park and my thesis director gave me their professional advice and offered me guidance regarding the feasibility of my ideas.

After conducting my literature search, I formulated possible program ideas, which were approved by my thesis director and by Congaree National Park. In order to better assess the opinions of college students regarding these topics, I developed a short survey. The survey focused on (a) demographic information, (b) their opinion on whether spending time in nature can improve mental well-being, (c) how often they spend time in nature, and (d) the likelihood that they would attend any of the possible initiatives, whether on-campus or at Congaree. To disseminate the survey, I emailed several departments asking them to share the survey on their

listserv, emailed previous professors and asked them to share the survey with their current students, and shared my survey on student group messages and with student organizations.

Once the results of the survey were analyzed, the two wellness events with the most “votes” would be implemented. While planning the implementation phase of my project, I collaborated with the Honors College, the Russell House Student Union, the counseling department, Congaree National Park, and other regional departments, such as the art department, on-campus.

To better reach my target population, I also collaborated with the on-campus counseling department. After emailing some contacts at the counseling department, I was able to meet with Dr. Porter, the interim head of counseling and psychiatry on-campus. This partnership was integral to reaching my target population and allowed me to collaborate with knowledgeable experts. The main outcomes that I hoped to accomplish with this partnership included placing pamphlets about Congaree National Park in the waiting rooms at the counseling center and advertising my wellness events in the waiting room.

## Results

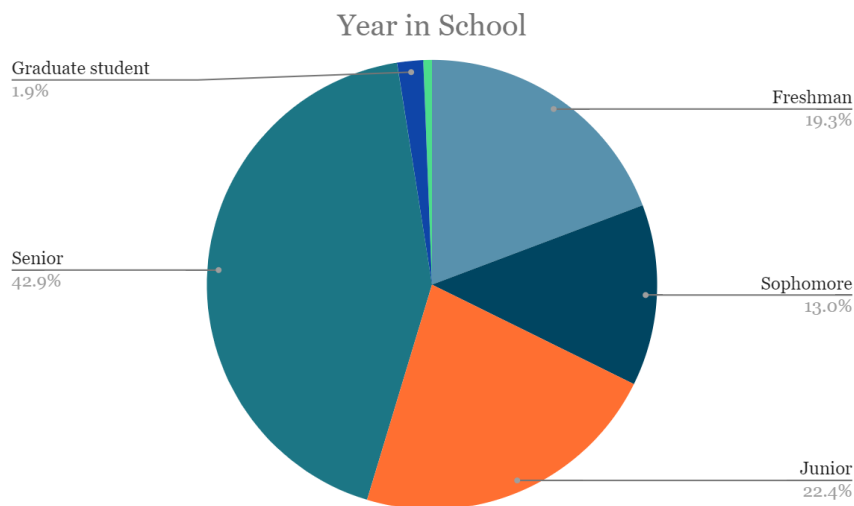
After disseminating my survey using several outlets, a total of 161 people responded. The respondents were overwhelmingly female with 79.5% identifying as female, 19.9% identifying as male, and .6% identifying as non-binary/transgender. Approximately 43% of respondents were seniors, 22.4% were juniors, 13% were sophomores, 19.3% were freshmen, 1.9% were graduate students, and .6% identified as other (Figure 1). The distribution of race and ethnicity among respondents was well varied with 78.5% identifying as Caucasian (non-Hispanic), 6.2% identifying as African American, 5.6% identifying as Asian, 2.5% identifying as Latino/Hispanic, 5% identifying as 2 or more racial groups, and 1.2% identifying as other (Figure 2). Nearly 51% of respondents had not been to a park in the last month, 41% had been to a park 1-3 times in the last month, 5% had been to a park 4-6 times in the last month, and 3.1% had been to a park 7 or more times in the last month (Figure 3). Furthermore, 35.4% of respondents have been to Congaree National Park and the remaining 64.6% have never visited the park (Figure 4).

The next part of the survey assessed students' opinions about their own mental well-being status, the connection between nature and mental wellbeing, and how often they spend time outside. To quantify students' ratings of their own mental well-being, a 5 point Likert scale was used with 1 signifying very poor and 5 signifying excellent. A graph displaying respondents' ratings of their mental well-being is given below (Figure 5). Similarly, a 5 point Likert scale (1=strongly disagree and 5=strongly agree) was used to assess students' opinions about the connection between mental well-being and nature. The first question asked if students believed that there was a clear connection between mental well-being and spending time in

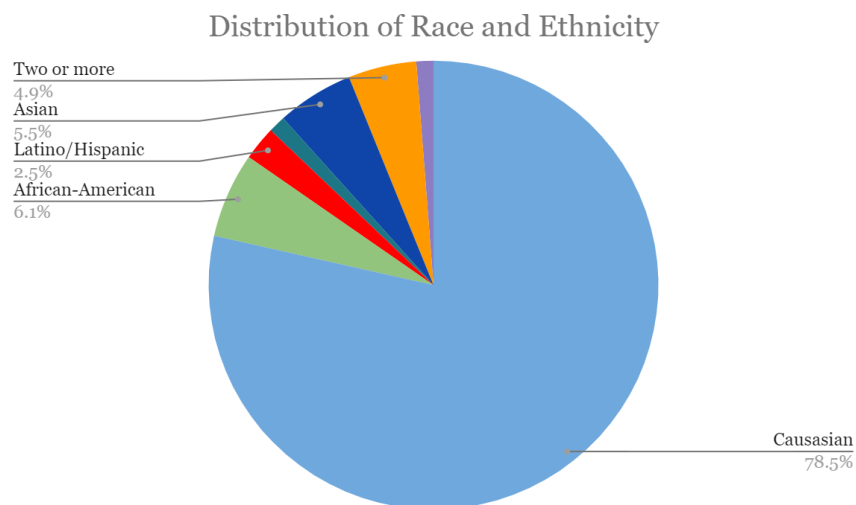


nature and the second question asked if they thought spending more time in nature would help their mental well-being (Figure 6 and 7, respectively). To better assess how often respondents spend time outside, one question asked how many days a week respondents spent at least 30 minutes outside in nature, whether that be sitting outside or exercising (Figure 8).

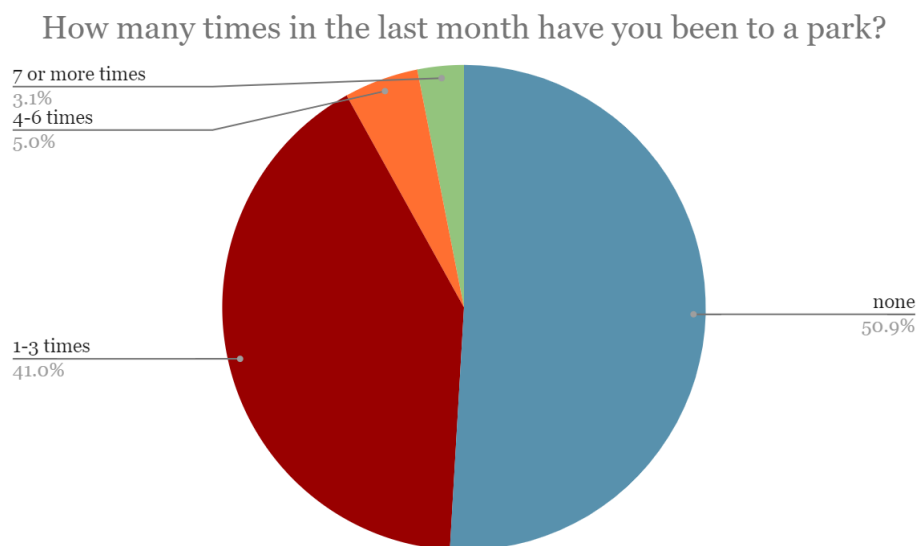
The final portion of the survey asked respondents to rate the likelihood that they would attend any of the possible mental well-being events, hosted either on-campus or at Congaree National Park (Table 1). The two events (landscape painting event and the pre-finals de-stress event) with the most “votes” were implemented. To better accommodate those with transportation limitations as approximately 18% of respondents cited that as a reason that may prevent them from spending time outside, one event was be hosted on-campus.



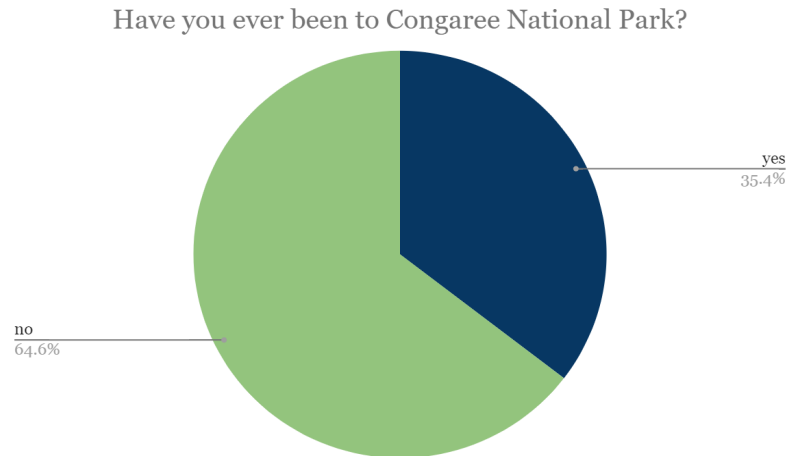
**Figure 1** displays the distribution of grade level among survey respondents. The sample is composed of 69 seniors, 36 juniors, 21 sophomores, 31 freshmen, 3 graduate students, and 1 “other.”



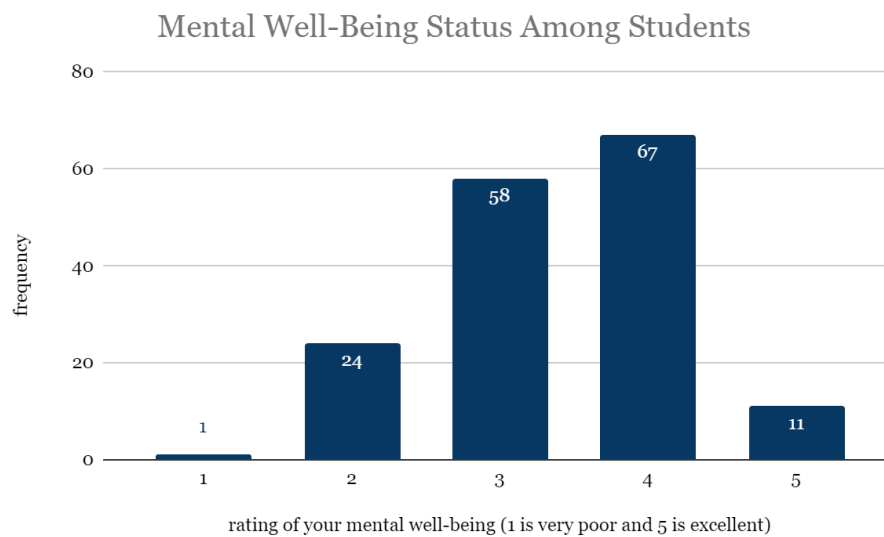
**Figure 2** displays the distribution of race and ethnicity among sample respondents.



**Figure 3** displays how many times in the last month respondents have attended any park (local park, state park, etc.).

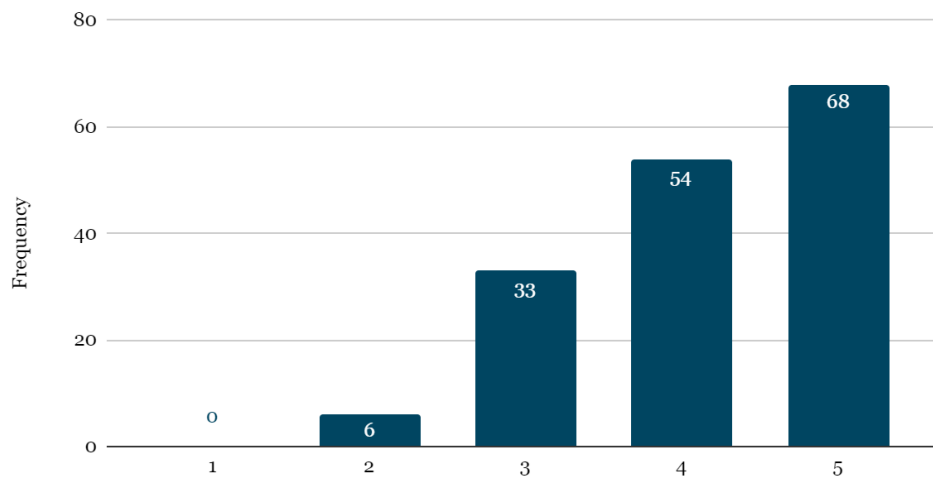


**Figure 4** displays the percentage of respondents who have previously been to Congaree National Park.



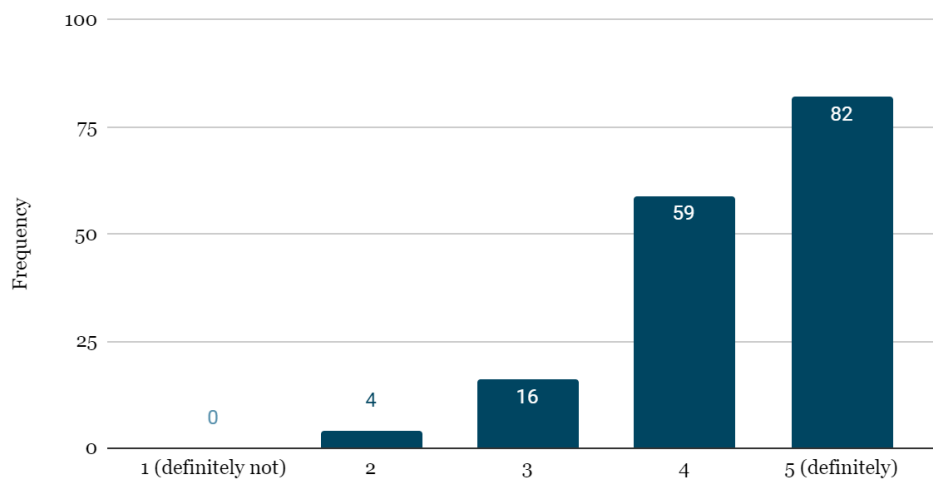
**Figure 5** displays respondents' rating of their own mental wellbeing with 1 being very poor and 5 being excellent.

I believe there is a clear connection between mental well-being and spending time in nature.



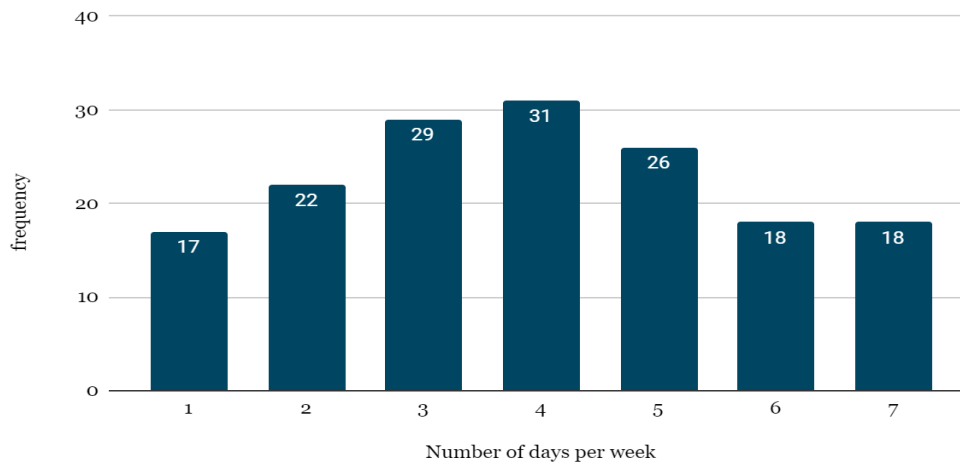
**Figure 6** displays whether or not students agree with the statement “I believe there is a clear connection between mental well-being and spending time in nature,” where 1 is strongly disagrees and 5 is strongly agrees.

Do you think spending more time in nature would help your mental well-being?



**Figure 7** displays students’ opinions on whether or not they thought nature could improve their mental well-being.

How many days per week do you spend at least 30 minutes outside in nature?



**Figure 8** displays how many days a week respondents spend at least 30 minutes outside.

**Table 1.** Displays the likelihood respondents would attend different well-being events with 1 being definitely not and 5 being definitely.

Likelihood of attending event:	1 (definitely not)	2	3	4	5 (definitely)
<b>Yoga session and guided walk</b>	21 (13%)	34 (21.1%)	39 (24.2%)	32 (19.9%)	35 (21.7%)
<b>Wilderness 101</b>	28 (17.4%)	38 (23.6%)	44 (27.3%)	32 (19.9%)	19 (11.8%)
<b>Scavenger hunt</b>	22 (13.7%)	43 (26.7%)	41 (25.5%)	32 (19.9%)	23 (14.3%)
<b>Pre-finals distress event</b>	11 (6.8%)	18 (11.2%)	34 (21.1%)	59 (36.6%)	39 (24.2%)
<b>Painting a natural landscape</b>	17 (10.6%)	16 (9.9%)	30 (18.6%)	50 (31.1%)	48 (29.8%)
<b>Nature journaling</b>	34 (21.1%)	47 (29.2%)	39 (24.2%)	27 (16.8%)	14 (8.7)
<b>Beginners birding event</b>	56 (34.8%)	47 (29.2%)	30 (18.6%)	17 (10.6%)	11 (6.8%)

## Discussion

While researching my topic, I stumbled upon a website called Parks RX. This organization allows healthcare professionals to write “park prescriptions” to supplement their patients’ treatment plan. The goal of Parks RX is to connect a healthcare or social service provider with local and national parks in order to provide community members with a safe space to spend time outside with the intention of improving their health and well-being. They have an official collaboration with the National Park Service, but at the time I started my project, Congaree did not have a partnership with the organization. I knew that this was something I wanted to get involved in, so I immediately reached out to my contacts at Congaree about getting this process started. Together, we were able to add Congaree to the list of official parks that prescribers can “prescribe.” As a result, Congaree is now listed on their website and has official “Parks RX” business cards. So, if park goers were interested in participating in Parks RX, they could take a card to their healthcare provider, set up an account, and then come up with a treatment plan. I was also able to provide these business cards to the on-campus counseling department along with the Congaree pamphlets, so if a student was interested in participating in the program, they can work with their counselor to set up their parks prescription. The Parks RX program is not meant to replace existing treatment, such as medications or cognitive behavioral therapy, but instead acts as another “tool” that patients can add to their “toolkit” to help them live a healthy and happy life. Although Parks RX was not an intended part of my thesis, it was a great “side project” that has the potential to help so many individuals, not just college students.

## **I. Natural Landscape Painting Event**

The first event that was implemented was an on-campus painting event hosted by myself and Professor Jordan Sheridan. Due to my extremely limited knowledge about painting and the arts in general, I thought it would be best to have someone with a painting background help me lead the event. I reached out to some artists that Congaree National Park has worked with in the past and the director of the School of Visual Art and Design at UofSC, Professor Laura Kissel. She then referred me to one of her painting instructors, Professor Jordan Sheridan, who was interested in helping me. After having a virtual meeting to discuss my goals and what I needed help with, Professor Sheridan agreed to help coordinate the event with me. This event would not have been as nearly successful without Professor Sheridan.

To advertise for the event, I was able to hang up flyers that contained a QR code link to the sign-up sheet. I hung up the flyers in the counseling center waiting rooms, in SVAD, and the humanities building. I also advertised the event informally through “word of mouth” and by sending sign-up links in different group chats that I am a member of. By the day of the event, all 11 spots were filled. A total of 9 people attended the event, as one person who signed up got sick and another informed me after the event that she was unable to make it last minute.

Materials for the event were provided by Congaree National Park, the University of South Carolina’s Honors College through their Senior Thesis Grant, as well as OneColumbia. The funding from the Honors College was used to purchase 11 large drawing boards, watercolor paint, and brushes. OneColumbia allowed me to borrow 11 of their large easels for the event as long as I provided transportation for the easels. Through the Forest Wellness Program at Congaree National Park, I was able to borrow some more watercolor paint and brushes. I

provided some extra materials, such as cups for water, paper towels, and trash bags to clean everything up.

The painting event took place in the middle of the Horseshoe, one of the most “picture perfect” places on-campus. Participants were able to choose where exactly they wanted to paint as long as no one strayed too far from the group because Professor Sheridan wanted to be able to help everyone. To accommodate as many people as possible, participants were able to leave the event at any time, as some had afternoon classes or finished painting sooner than others.

Throughout the event, we had many people approach us, asking what type of class this was or that they loved the idea as they had never seen something like this on-campus before. A representative from student life came out to take a few pictures of the event; although, he did not inform us if these images were going to be used for any social media posts. It was very reassuring to see so much positive feedback from random people passing through the Horseshoe as it demonstrated that there was a lot of interest across different groups, not just among students.

Participants at the event had different painting backgrounds, as some students were art majors whereas others have not painted since art class in elementary school. Professor Sheridan was very positive with all students and continuously stressed that the point of the event was to have fun and that they should not compare themselves to the person next to them. As the event progressed, more participants started to interact with one another and “have fun with it” as that was the main purpose of the event.

To evaluate the success of the event, I had participants complete an anonymous six-question survey. The first question asked participants to rate their overall mental well-being before the event on a scale from 1 (very poor) to 5 (excellent); the average was 2.25. The next question asked participants to rate their mental well-being after attending the event using the



same scale; the average was 4.375. 100% of participants agreed that the painting event improved their overall mental well-being, so my goal had been achieved. Then, the survey asked participants if they plan on spending more time outside after attending the event. 87.5% said yes and 12.5% said maybe. The fifth question asked participants if they thought that there was a clear connection between spending time outside in nature and their overall mental well-being. 87.5% said yes and 12.5% said no. The person who responded “no” surprised me as 100% of respondents said they felt like this outside painting event improved their mental well-being. The last question was a general feedback question in which participants did not have to respond. Two common responses amongst participants were that they suggested choosing another location with less foot traffic/somewhere more secluded and that they wished this was a regular event. Professor Sheridan thought that the event was such a success that she is currently talking to the director of SVAD about making this a permanent event in which students and faculty/staff can participate. I think this would be a great idea as I was hoping that the events that I implemented could be continued after my graduation.

If this event was to be continued in the future, the event could be held at different locations both on- and off-campus to accommodate those who (a) do not have access to transportation and (b) prefer to be in a more secluded location, such as Congaree National Park. We could also partner with different student organizations or clubs to help increase participation.

## **II. Pre-finals de-stress event at Congaree National Park**

The second event that was implemented was a pre-finals de-stress event at Congaree National Park hosted by myself and staff at the park. To advertise the event, I was able to hang up flyers with a QR code that takes students to a sign-up sheet in each of the counseling center waiting rooms. Like before, I also shared the sign-up sheet with friends, by word of mouth, and via group messaging apps. I also made a poster and posted it on my social media account with a link to the sign-up sheet. In total, we had 7 participants attend the de-stress event at Congaree. It was more difficult to attract people to sign up for this event, but there are several reasons that may explain this. Some people mentioned that they wanted to come to the event, but did not have access to transportation. It was also the last day of classes, so a lot of students had group projects due that night and could not commit enough time to driving to and from the event. Students did mention that if this was at a different time (not right before finals), they would have attended the event. That information was noted as my plans for future de-stress events will be scheduled at a less busy time.

The activities for the de-stress event included a 1-hour meditative walk led by a Wellness Program volunteer who has prior experience leading these hikes, a short progressive muscle relaxation exercise led by myself, and then s'mores around a campfire. Materials for the s'mores were provided by Congaree National Park and myself. The meditative walk mainly took place on the Congaree boardwalk as we wanted to accommodate those of differing physical capabilities. The goal of the walk was to "stay present" and take in all of the immediate surroundings ("listen to the rustling of the leaves and the sound of shoes hitting the boardwalk.") Most of the

participants did not have much experience with meditation, so the meditative walk was meant for beginners.

After the meditative walk, participants were directed towards a group campground where they participated in a short progressive muscle relaxation exercise followed by s'mores around a campfire. To ensure safety, the fire was set up and put out by a park ranger. The progressive muscle relaxation was led by myself and consisted of participants flexing a certain part of their body and then relaxing it, letting all of the tension go. Throughout the exercise, participants were reminded to take deep breaths and to refocus on their breath if they felt that their mind was drifting. The s'mores portion of the event was very casual, in which the participants were able to talk and get to know one another. During this time, I asked participants to fill out the same six-question, anonymous survey I gave to the participants of the painting event.

As stated above, the first question of the survey asked participants to rate their mental well-being before the event on a scale from 1 (very poor) to 5 (excellent). The average rating was 2.8. The second question asked participants to rate their mental well-being after attending the event using the same scale; the average rating was 4.4. The next three questions asked participants if (1) they thought that the event helped their mental well-being, if (2) they plan to spend more time outside in nature after attending the event, and if (3) they thought that there was a clear connection between spending time outside in nature and their overall mental well-being. All respondents said "yes" to each question. The last question in the survey was optional and gave participants the opportunity to provide any additional feedback. All of the responses were positive ("I don't often do stuff like this and I'm so glad I tried this! I would love to meditate more or just be in natural environments more.") and one participant suggested doing the meditative walk on the ground as opposed to the boardwalk to feel more "engaged."

Despite the smaller number of participants. I think the de-stress event at Congaree was a huge success. I think participants found the event more beneficial since they were able to get to know one another and felt more comfortable conversing with each other. In addition, I think it would have been difficult to do the meditative hike with more than 10 people just because that exercise is not as conducive to a large group. I have the intention to do more de-stress events at Congaree in the Spring 2022 semester and plan on capping the event at 10 people just to ensure each participant gets the most out of the event. Some adjustments that might be made to the event include doing a meditative hike on a trail as opposed to the boardwalk and a short journaling activity after the meditative hike. This will give the participants the ability to reflect on their experiences.

## **Possible Limitations**

There were several limitations that I encountered while completing my senior thesis. First, I used a voluntary response sample when disseminating my survey. As a result, the results of the survey may be biased and some demographic groups may be overrepresented while others are underrepresented. For example, nearly 80% of survey respondents identified as female, so the male perspective may be underrepresented. One possible reason why so few males responded to the survey is the stigma still surrounding male mental health. Although many people are working incredibly hard to break down this stigma, some men may not feel comfortable sharing their opinions about this topic.

Another limitation for the events I had planned included capacity limits. Since we had limited supplies for the painting event, we could only host 11 students. If we had more than 11 easels and drawing boards, I would have loved to have had a slightly bigger event with more students able to participate, especially because nearly 60% of respondents were very interested in the painting event. An alternative solution, if time was not a constraint, would be to host several painting and de-stress events, so more students could participate. Based on the overwhelmingly positive feedback, we plan on hosting similar events in the Spring 2022 semester.

If there were no time constraints, I would have had the opportunity to host more wellness events, whether that be different events from the ones I implemented or several painting or de-stress events throughout the semester. As a result, I would have been able to have more students participate in the events and would have potentially benefitted more people. However, since we got such positive feedback from both events that I was able to host, I am hopeful that we will be able to host more events like these in the future, whether that is something I do in the spring or if someone continues to do similar events after I graduate.

## **Conclusion**

As the mental health epidemic amongst college students continues, universities and health professionals must provide students with as many resources and tools as possible to promote mental well-being. I found spending time in nature to be very beneficial to my mental well-being following my brain injury, but I did not find any university-sponsored events that specifically addressed nature and mental well-being. Therefore, I decided to take the matter into my own hands and developed two programs that encouraged college students to spend more time in nature in order to promote their mental well-being. To ensure that the programs were something students were interested in, I disseminated a survey and listed several different well-being program options. The two most popular programs were implemented (nature painting event and a pre-finals de-stress event). At the conclusion of each event, participants were asked to fill out a six-question follow-up survey that assessed their opinions about the event and if it improved their mental well-being. I was extremely proud when I saw that 100% of participants in each event thought that it improved their mental well-being. The programs were designed to be continued after I graduate, so future generations of USC students can learn more about the positive benefits nature has on mental well-being.

## Acknowledgments

- Dr. Grego, my thesis director, and everyone at Congaree National Park, specifically Greg Cunningham, Jon Manchester, Karli Sinclair, and Erin Lesslie for all of their hard work and support to help get this project implemented.
- Professor Jordan Sheridan, who was integral to the success of my on-campus painting event. She not only provided us with her time and expertise but also helped us transport materials to and from the event.
- OneColumbia, who allowed me to use their 11 large easels free of charge.
- Dr. Elizabeth Porter, interim head of counseling and psychiatry on-campus. She allowed me to lay out pamphlets for Congaree National Park in the counseling center waiting rooms as well as sign-up sheets for each event that I hosted.

This work was supported in part by the South Carolina Honors College Senior Thesis/Project Grant.

## Reflection

After my traumatic brain injury freshman year of college, everything I knew was taken away from me. I grew up an athlete and never imagined that I would be unable to run or play soccer ever again. However, 3 years later, that is still the reality as my body cannot handle the physical stress. About 2 years ago, I began to try and walk outside as that was my only way to exercise. I had no idea that spending a few hours outside every week would improve my mental well-being so much. Even once I came back to school full-time, I made it a priority to try and take a walk outside a few days a week if my body would allow it. That 30-minute stroll 3 days a week has done so much to help me during recovery. I may not be able to run or play soccer anymore, but I have learned to adapt. I look forward to my walks now as that is my time to de-stress. Once I figured out how much nature has helped me heal, I knew I wanted my thesis to involve nature and mental health as I think it is a super important message that the entire world deserves to know.

When I first started this thesis, my intention was for it to be more of a research-based paper. However, the more research I did, the more I realized that it would be more beneficial for myself and for my peers to turn it into a project-based thesis. There is a mental health epidemic amongst college students and if I had the power to even help a few people with their mental well-being, then I knew I would do everything I could to take this project off the ground. However, I could not have done this project without the expertise provided by park rangers at Congaree National Park. Their Forest Wellness Program served as an inspiration for my project except my events were specifically targeted towards college students' mental well-being as opposed to the general population.



When planning the events, I was very unsure if anyone would even be interested in participating as the university does not usually host events like this. However, I was hopeful given the feedback from the initial survey I sent to the student body in September. Once students began to sign-up for the events, my anxiety slowly subsided. Although I did not get as many people to sign-up for the de-stress event at Congaree, I think it was much more beneficial that there was a small group. They were able to enjoy each other's company as they felt less nervous.

I am extremely happy about how my thesis project went and felt like I helped improve some of the students' mental well-being. I completed this project with the intention that the events can be executed by someone else after I graduate. When I started this project back in the Spring of 2021, I remember writing that I wanted this thesis to be my "legacy" after I graduate. If someone is able to continue hosting similar events in the future and continue the partnership with Congaree National Park, then I will have accomplished all of my goals.

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