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The Impact of Brief Mindfulness Training on Occupational Therapy (OT) Students' Perceived Level of Stress

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The Impact of Brief Mindfulness Training on Occupational Therapy (OT) Students' Perceived Level of Stress

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Eastern Kentucky University
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Executive Summary

Background: Mental health issues and burnout are becoming more common among students in healthcare programs (Dyrbye et al., 2014). As demands placed on healthcare professions continue to increase, there has been an increased interest in researching the practice of mindfulness to promote self-care (Irving et al., 2009). Mindfulness has been defined as "the awareness that emerges through paying attention on purpose, in the present moment, and nonjudgmentally to the unfolding of experience moment by moment" (Kabat-Zinn, 2003, p. 145). Mindfulness has been shown to decrease stress and anxiety among pre-healthcare college students (Burgstahler & Stenson, 2020). Little research has investigated the impacts of mindfulness on occupational therapy (OT) students specifically.

Purpose: The purpose of this capstone project is to address the evidence gap on the effect that an array of mindfulness strategies may have on perceived stress in OT students at various curricular levels. The study will seek to answer the following research question: Does brief and information education and training in basic mindfulness techniques and strategies impact perceived levels of stress among occupational therapy students?

Theoretical Framework. This capstone project was guided by the *Occupational Therapy Practice Framework – 4 (OTPF-4;* American Occupational Therapy Association, 2020) and the occupational adaptation (OA) model.

Methods. This study used a quantitative one-group pre- post-test design. The intervention (independent variable) was a brief and informal mindfulness training and education developed and delivered by the student researcher. The dependent variable was perceived level of student stress as measured by the *Perceived Stress Scale (PSS*; Cohen et al., 1983).

Results: A significant difference ($p<0.05$) was shown from pre- test to post-test scores following the intervention. There was no significant relationship ($p=0.056$) between PSS score change and curricular level and/ or gender.

Conclusions: The results of this study indicated that brief, informal mindfulness training and education designed to be incorporated into daily life can have a significant impact on OT students' perceived level of stress. Continued research using a mixed-methods approach is recommended to help optimize the intervention based on students' preferences.

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EASTERN KENTUCKY UNIVERSITY
COLLEGE OF HEALTH SCIENCES
DEPARTMENT OF OCCUPATIONAL SCIENCE AND OCCUPATIONAL THERAPY

CERTIFICATION OF AUTHORSHIP

Submitted to (Faculty Mentor's Name): Cheryl Carrico Ph.D, OT/L
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Student's Signature: 

Date of Submission: 5/10/2023

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Section 1: Nature of Problem and Problem Identification

While one might assume that burnout is most likely to occur in seasoned healthcare professionals, mental health issues and burnout are becoming more common among students in healthcare programs (Dyrbye et al., 2014). The *Healthy Minds Study* recently polled graduate and undergraduate students (*n*= 32,754) from over 35 colleges and universities across the United States and found that nearly 60% of college students surveyed identified as having symptoms of anxiety or depression in the last 12 months (Eisenberg et al., 2020). This is an increase from 43% in 2014, when 21% of students reported having overall depression and 22% reported having generalized anxiety (Eisenberg et al., 2014).

Specifically, regarding allied health students, Webber et al. (2022) found that 30% of occupational therapy (OT) and physical therapy (PT) students in one entry-level master's program cohort reported having moderate, severe, or extremely severe levels of stress, anxiety, or depression. Of the students who reported a moderate level of stress or higher, the majority also reported moderate or higher levels of anxiety (69%) and depression (88%). The scores from the student's *Depression and Anxiety Stress Scale (DASS*) were compared with a previous sample of 499 adults who had no history of a mental health diagnosis. The comparison found that stress levels were higher among these students when compared to the general sample of adults (Webber et al., 2022).

As demands placed on healthcare professionals continue to increase, there has been an increased interest in researching the practice of mindfulness to promote self-care (Irving et al., 2009). Mindfulness has been defined as "the awareness that emerges through paying attention on purpose, in the present moment, and nonjudgmentally to the unfolding of experience moment by moment" (Kabat-Zinn, 2003, p. 145). One example of a mindfulness technique is called a *body*

scan where the participant intentionally brings awareness to one body part at a time, starting at the head and moving all the way to the toes (Ackerman, 2017). Other examples of mindfulness techniques include mindful seeing, mindful listening, and mindful walking, all of which involve maintaining intentional awareness of the colors, textures, and sounds in the environment at any and each given moment (Ackerman, 2017). Mindfulness has been shown to decrease stress and anxiety among pre-healthcare college students (Burgstahler & Stenson, 2020). In healthcare students, it has been shown to help decrease stress, anxiety, and depression as well as increase mood and self-efficacy (McConville et al., 2017).

One of the only studies that has investigated the impacts of mindfulness on OT students specifically was a pilot study conducted by Palase et al. (2019). This study examined incorporating mindfulness strategies into a Level I fieldwork seminar to reduce students' perceived level of stress. Results showed that mindfulness intervention did not have a significant impact on reducing the perceived level of stress. However, the intervention focused only on (a) mindful breathing exercises and the body-scan technique; and (b) a Level I cohort (Palase et al., 2019). More research is needed to determine whether education on a wider array of mindfulness strategies may help with stress management for OT students at various curricular levels (e.g., undergraduate; graduate).

Problem Statement

The problem this capstone project addressed is the evidence gap on the effect that an array of mindfulness strategies may have on stress in OT students at various curricular levels. The author addressed this problem by investigating whether an intervention aimed to educate OT students about a variety of mindfulness strategies reduced their perceived level of stress.

Research Purpose and Question

The study sought to answer the following research question: *Does brief and informal mindfulness training impact perceived levels of stress among OT students?* The independent variable was a novel protocol aimed to educate participants about mindfulness techniques designed for easy incorporation into the everyday life of an OT student. The dependent variable was the students' perceived level of stress as measured by a standardized self-report rating scale called the *Perceived Stress Scale (PSS;* Cohen et al., 1983). The target population was OT students at various curricular levels recruited from a university in the east central region of the United States.

Theoretical Framework

This capstone project was guided by the *occupational adaptation (OA)* model (Schkade & Schultz, 1992). The goal of the OA model is to promote and facilitate a person's ability to adapt (Schkade & Schultz, 1992). It is based on the idea that adaptation is necessary for healthy participation and engagement in occupations (Schkade & Schultz, 1992). In the OA model, the role of an OT is to facilitate clients' empowerment and mastery of desired activity or occupation (Schkade & Schultz, 1992). Accordingly, the mindfulness-based intervention in the present capstone was conceptualized as a means by which to empower students with adaptive skills relative to the stressors and occupations of their everyday lives.

Further guideposts for the present capstone included concepts of mindfulness as well as the American Occupational Therapy Association's (AOTA's) *Occupational Therapy Practice Framework- 4* (*OTPF-4;* AOTA, 2020). The concept of mindfulness is historically rooted in Buddhist psychology (Brown et al., 2007). Mindfulness interventions are based on the idea that being aware of the present moment, in a nonjudgmental way, can create positive physical and

mental health outcomes (Williams & Kabat-Zinn, 2011). The OTPF-4 is grounded in the ideas that humans are occupational beings and that there is a positive relationship between occupation and overall health and well-being (AOTA, 2020). This relationship may be considered relative to Elliott's (2011) conceptualization of mindfulness as not only a means to experience occupations in a meaningful way but also as an occupation itself (e.g., meditation). Moreover, because occupations have the capacity to support other occupations (AOTA, 2020), and since mindfulness encourages awareness of the present moment, the intervention in this capstone project was conceptualized as both an occupation and a means for fuller, more adaptive engagement in daily occupations for students.

While there is limited research on the impact mindfulness intervention techniques have on outcomes related to occupational performance (Elliott, 2011), there is evidence that supports the use of mindfulness in university students to reduce stress (Burgsthler & Stenson, 2020; McConville et al., 2017; Gutman et al., 2020; Greeson et al., 2014); decrease depression and anxiety (Burgsthler & Stenson, 2020; McConville et al., 2017); improve sleep quality (Gutman et al., 2020; Greeson et al., 2014); increase energy levels (Gutman et al., 2020); increase levels self-acceptance (Greeson et al., 2014; Hjeltnes et al., 2015); increase focus during learning situations (Hjeltnes et al., 2015); and support self-care and wellbeing in health-care student populations (Irving et al., 2009). These benefits can also be described using terms from the OTPF-4 (AOTA, 2020)—namely, *performance patterns* and *performance skills*, specifically, *process skills*. *Performance patterns* are defined by the *OTPF-4* as "the acquired habits, routines, and rituals used in the process of engaging consistently in occupations and can support or hinder occupational performance" (AOTA, 2020 p. 12). For example, if a student can establish a performance pattern of using mindfulness strategies throughout the day, it may have an impact

on their ability to establish better routines relating to sleep. Positive performance patterns may then have a positive impact on their performance skills, allowing them to focus longer and have more energy. These improved performance patterns, routines, and performance skills could improve their overall ability to perform the occupation of studying. It could also increase their ability to perform duties associated with their other valued roles (e.g., leadership positions; friend; spouse; co-worker).

In short, the present project was designed to facilitate increased ability to problem-solve, cope, and adapt via mindfulness strategies support participation and engagement in occupations for students. This design used principles from the OA model, the *OTPF-4*, and mindfulness as its conceptual foundation.

Study Significance

The present study is poised to address a significant evidence gap by examining the impact that brief mindfulness training has on OT students' perceived level of stress as measured with the PSS. More specifically: while some evidence has indicated that mindfulness training can be effective for reducing stress in college and healthcare students (Bamber & Schneider, 2016; Galante et al., 2018; McConville et al., 2017), this research used outcome measures other than the PSS and did not focus specifically on OT students at various curricular levels. Other evidence indicating that mindfulness reduces stress as measured with the PSS (e.g., Burgstahler & Stenson, 2020) was not derived from samples using OT students.

Brief mindfulness training has been shown to be preferable to structured training among college students in general (Aherne et al., 2016; Greeson et al., 2015); but there is a lack of this type of evidence with regard to OT students specifically. By directly advancing knowledge about the relationship between brief mindfulness training and stress reduction in OT students,

results of the present study may be used to help create easily adoptable educational programs designed to enhance OT students' ability to deal with stressors such as demanding course work and fieldwork placements. An example might be brief mindfulness training in an entry level/ foundational course or a pre-fieldwork seminar. Moreover, if this study's intervention is shown to be effective in reducing perceived stress among OT students, it would lay groundwork for future investigations of its potential impact on performance in fieldwork settings and beyond. Even more broadly, universities may wish to consider prioritizing education on stress management and self-care techniques such as mindfulness to optimize their students' fitness and readiness for their present and future roles.

Section 2: Literature Review

The concept of mindfulness is historically rooted in Buddhist psychology (Brown et al., 2007). Mindfulness based interventions (MBIs) can include well-researched psychological practices that are characterized by control of attention, awareness, acceptance, non-reactivity, and nonjudgmental thoughts and improving these skills through meditation practice (Bamber & Morpeth, 2019; Kabat-Zinn, 2003). MBIs are based on the core idea that being aware of the present moment, in a nonjudgmental way, can create positive physical and mental health outcomes (Williams & Kabat-Zinn, 2011). The most common MBI protocols are mindfulness-based stress reduction (MBSR) and mindfulness-based cognitive therapy (MBCT) (Bamber & Morpeth, 2019). The philosophical differences between MBSR and MBCT is that MBSR uses a combination of Buddhist Vipassana and Zen Buddhist traditions that focus on "developing awareness over time through systematic exercises that train one's mind towards awareness of physical sensations and life events" (Gunarantana, 2011 as cited in Bamber & Morpeth, 2019, p. 204). In contrast, MBCT includes characteristics of MBSR but focuses on self-management,

control, and improvement (Chiesa and Malinowksi, 2011 as cited in Bamber & Morpeth, 2019). Generally speaking, MBIs can include formal meditation practice but also informal practices that aim to bring attention and awareness to all aspects of daily life (McConville et al., 2017).

MBIs have gained growing attention in the past decade as a way for college students to cope with psychological stress (Bamber & Morpeth, 2019). Even more research on mindfulness and its impact on anxiety and perceived stress has emerged as a result of the COVID-19 pandemic (Weis et al, 2020). Mindfulness interventions are designed to enhance and improve students' focus, attention, well-being, and overall mental health by way of increasing awareness to the present moment and regulating distressing thoughts and feelings (Weis et al., 2020). Other forms of mindfulness-based interventions that have been researched in university students include an adapted mindfulness course (Galante et al., 2018); guided meditations (Burgstahler & Stenson, 2020); an online mindfulness training program (Ried, 2013); mind-body skills workshops (Greeson et al., 2015); mindful breathing exercises and body scan meditations (Palase et al., 2019). These studies' overall findings suggest that there is preliminary evidence for the benefit of these interventions.

One of the largest randomized control trials completed using mindfulness training with university students was conducted by Galante et al. (2018). The purpose of this study was to assess whether a mindfulness courses adapted for university students would improve students' resilience to peak stress during exams as measured by the *Clinical Outcomes in Routine Evaluation Outcome Measure* (*CORE-OM*) (Galante et al., 2018). In this study, 616 university students were randomized to receive either mindfulness training with the *Mindfulness Skills for Students* course, plus mental health support as usual; or mental health support as usual, alone. The training consisted of a face-to-face, group-based skills training program adapted from a

course. The participants participated in eight weekly sessions that lasted 75-90 minutes and included mindful meditation exercises, periods of reflection, and interactive exercises; students were also encouraged to practice these techniques at home (Galante et al., 2018). Overall, results showed a significant difference between groups favoring the intervention group (95% CI 0.60-0.29; $p<0.0001$). The study concluded that offering mindfulness interventions aimed at the well student population is a useful addition to mental health services that can be used by university students (Galante et al., 2018).

Other notable studies include a narrative review of the literature completed that examined the impacts of mindfulness- based meditation to decrease stress and anxiety in college students (Bamber & Schneider, 2016). This review found that 25 out of the 34 studies that were included found a significant decrease in stress (Bamber & Schneider, 2016). This evidence indicates that mindfulness shows promise as an intervention to reduce stress in college students (Bamber & Schneider, 2016). However, this review did not focus on healthcare students, specifically. The researchers also mentioned that due to the variety of techniques, programs, strategies, frequencies, and durations of mindfulness interventions, more quantitative research is needed to determine which intervention protocol is most effective for reducing stress in this population (Bamber & Schneider, 2016).

A subsequent systematic review of 19 randomized and non-randomized control trials was conducted by McConville et al. (2017) to assess the effectiveness of mindfulness training in medical and other health professional student populations. Participants in the 19 studies included in the review were studying medicine, nursing, social work, psychology, and health sciences including podiatry, OT, and physiotherapy (McConville et al., 2017). Outcome measures included the assessment of mindfulness, anxiety, depression, stress, mood state, empathy, self-

efficacy, and resilience (McConville et al., 2017). Overall, this review found positive outcomes related to mindfulness-based interventions and decreased stress, anxiety, and depression and improved mindfulness, mood, and empathy among health professional students (McConville et al., 2017). The researchers also concluded that "the wider the appeal of a program, the more potential there is for students to engage and ultimately practice mindfulness" (McConville et al., 2017, p. 42).

After the review by McConville et al. (2017), Gutman et al. (2020) conducted a randomized controlled trial that examined the effectiveness of a mindfulness training program on healthcare students. The study randomly assigned 16 occupational and 20 physical therapy graduate students to either the intervention or control group (total $n = 36$). The intervention group participated in an eight-week mindfulness program that consisted of one weekly 40-minute in-person group session and four weekly 10-minute online guided meditations (Gutman et al., 2020). The study aimed to determine if the intervention could aid in better management and reduce stress over the course of a semester as measured by the PSS, the *Student Stress Management Scale*, mindfulness activity logs, open-ended qualitative questionnaires, GPA, and counseling visit frequency (Gutman et al., 2020). At post-intervention, a statistically significant difference ($Z = -4.291$, $p < .000$, $d = -1.84$) on PSS scores between the intervention ($M = 19.66$, $SD = 6.14$) and the control group ($M = 31.26$, $SD = 6.80$) was found. While the sample size was small, the study looked specifically at first-year physical therapy and OT students (Gutman et al., 2020).

The results of the study completed by Gutman et al. (2020) align with the findings of Burgstahler and Stenson's (2020) study that examined the impact of mindfulness on anxiety and stress in pre-healthcare college students. These researchers used pre- and post-test scores to

determine if brief (five to twelve minutes) of daily mindful meditation for six days per week for eight weeks had an impact on stress, anxiety, and mindfulness. Outcome measures used were the PSS, the *State-Trait Anxiety Inventory, and the Five Facet Mindfulness Questionnaire.* Results showed a significant difference between pre- and post-test intervention for all variables measured ($p< 0.05$). Overall, the researchers concluded that participation in daily meditation was associated with decreased stress ($p= 0.000$), anxiety ($p=.002$), and increased mindfulness ($p=0.000$) among this population (Burgstahler & Stenson, 2020). The authors also emphasized the idea that spreading awareness of mindfulness practices to college students and/or assigning self-care meditation as part of the curriculum may be a beneficial strategy for colleges and universities (Burgstahler & Stenson, 2020).

The studies discussed above showed positive results according strictly to quantitative outcome measures related to mindfulness-based interventions. In contrast, Aherne et al. (2016) used a mixed-methods approach to focus on focused on satisfaction and engagement of first- and second-year graduate medical school students following participation in a mindfulness-based stress reduction program (Aherne et al., 2016). Satisfaction with the mindfulness course was measured using a satisfaction rating scale. At the end of the satisfaction questionnaire, participants were given the option to make further comments and provide additional feedback. Results showed that there were high levels of satisfaction and positive feedback associated with the MBSR course when it was presented as optional (Aherne et al., 2016). These results were consistent with an earlier study by Greeson et al. (2015) aimed at evaluating the feasibility, acceptability, and initial effectiveness of a four-week stress management and self-care workshop for M.D./Ph.D. students. Students reported significantly reduced levels of perceived stress as measured by the PSS- *10 item* ($P < .001$). The investigators concluded that the study's brief,

voluntary, mind-body skills workshop was feasible, acceptable, and effective for reducing stress, increasing mindfulness, and enhancing self-care among these students (Greeson et al., 2015). While these programs were shown to receive positive feedback, there was no enrollment of OT students.

Other studies have yielded evidence derived from samples that included OT students (e.g., Reid, 2013; Stew, 2011). Although perceived stress was not a specific outcome measure in either of these studies, participants in both studies reported positive feedback about mindfulness training. The study by Stew (2011) was a qualitative investigation of the way OT students perceive and understand mindfulness, examine their responses to mindfulness, and explore how mindfulness can impact the students' academic work, clinical practice, and personal life. The sample included students from the physiotherapy, OT, and podiatry disciplines. Results showed that students preferred informal mindfulness strategies used during daily activities to periods of formal meditation practices (Stew, 2011). Students also reported an increased ability to focus and concentrate on their academic studies on specific occasions (Stew, 2011). Reid (2013) found that OT students who participated in online mindfulness training experienced changes in mindfulness as measured with the *Mindfulness Attention Awareness Scale* (Reid, 2013). Participants also reported experiencing positive life changes that included not being as focused on the past, not worrying as much about the future, and trying to accept and appreciate the present (Reid, 2013).

While the above studies examined OT students' understanding of mindfulness, perceptions of mindfulness, and change in mindfulness, there has been only one study (i.e., Palase et al., 2019) that examined mindfulness intervention and its relation to perceived level of stress in OT students. The purpose of this pilot study (n = 38) was to determine if the

implementation of mindful breathing and body scan exercises increased Level I fieldwork seminar students' level of mindfulness and/ or reduced their perceived level of stress (Palase et al., 2019). The dependent variables were measured with the PSS. The investigators found that the mindfulness intervention did not have a significant impact on reducing the perceived level of stress in OT graduate students (Palase et al., 2019). However, a limitation was that the intervention program focused only on mindful breathing exercises and body scan meditation. While these are tools that can be used in mindfulness practice, there are many other mindfulness activities such as setting an intention for the day, mindful eating, mindful walking, mindful listening, and practicing thoughts of gratitude and self-compassion (Hoshaw, 2021 & Voci et al., 2018). Moreover, although the pilot study involving OT students and mindfulness did not show significant impact on the students' perceived level of stress (Palase et al., 2019), the generally positive response to students being exposed to mindfulness in the studies completed by Stew (2011) and Reid (2013) suggests that further in-depth research on introducing students to mindfulness should be continued.

Section 3: Methods

Project Design

This study used a quantitative one-group pre- post-test design. The intervention (independent variable) was an informal mindfulness presentation developed and delivered by Emily Masters, OTR/L (i.e., the student researcher for this project). The presentation was designed to take place in person at an established date and time agreed upon by the student researcher and student group faculty advisors. The dependent variable was students' self-reported level of stress as measured by the PSS (Cohen et al., 1983).

Convenience sampling was used in this study. Potential participants were recruited from the university where the student researcher is enrolled in a post-professional Doctor of

Occupational Therapy program. The university is in the eastern central United States and is a public regional university. Recruiting was done via communication with faculty in the university's occupational science and therapy department. A recruiting flyer (Appendix B) was shared with these faculty via email asking them to display and distribute the flyer to recruit voluntary participation from the OT students they supervise. To ensure recruitment targeted various curricular levels, the study recruited from both undergraduate and graduate student groups (i.e. the Student Occupational Therapy Association (SOTA); Phi Theta Epsilon Honor Society (PTE); Student Occupational Science Association (SOSA)).

A link to the informed consent document was included in the recruiting flyer, along with the student researcher's contact information. This gave potential participants adequate time to review the document and determine if they wanted to participate and/or contact the student researcher with further questions. Interested participants were asked to attend the in-person mindfulness presentation given by the student researcher. When potential participants arrived at the presentation, they were given a paper copy of the informed consent document. The document was reviewed with participants by the student researcher and any questions were answered. Potential participants wishing to continue with the research study and view the presentation were asked to sign the document at that time to enroll. A copy of the signed document was made available to all participants.

Prior to the start of the in-person presentation, participants used their personal cellular devices to scan a QR code to complete the electronic PSS pre-test. The electronic version of the PSS was administered by the student researcher using Google Forms. Google Forms is a free, web-based, survey administration software. Users of Google Forms are only able to review their responses to the survey questions. The Google Form also included two demographic items where

participants were asked to identify: gender (male/ female/ nonbinary) and level in the OT program (graduate student/ undergraduate student).

The student researcher then delivered a 20-minute presentation that discussed general information regarding the definition of mindfulness (three slides); benefits of mindfulness (one slide); and why the student researcher is pursuing a research study on this topic (one slide). The overall aim of the presentation was to educate participants on mindfulness strategies and techniques that can be completed on their own time and can be easily incorporated into their daily routines (eight slides). At the conclusion of the presentation, participants were verbally thanked for their time and given information on when to expect follow-up emails.

The student researcher then sent participants one follow-up email per week that contained reminders and resources for how strategies presented in the presentation could be used (Appendix C). A link to the post-test PSS was e-mailed directly to the participants by the student researcher at the six-week timepoint following the initial presentation, via Google Form. Three reminder e-mails were sent to participants across two additional weeks to help maximize the response rate.

Setting

The research procedures were conducted on campus within the OT department at the university. Participants were required to come to campus one time during the study. The visit was scheduled to take 45 minutes to one hour. Participants needed to be able to access WiFi on their cellular device in order to participate in the electronic pre-test PSS. Seating afforded participants a full view of the shared screen where the PowerPoint mindfulness presentation was projected. After that, participants were instructed to practice short mindfulness techniques on their own at home or on campus over the next six weeks. The post-test PSS was completed at or

shortly after the six-week intervention period in a manner identical to pre-testing except that it was completed in a location of the participants' own choosing. The total amount of time participants were asked to volunteer for this study was two hours spread over a six-week period. Participants were instructed that this amount of time could increase depending on the amount of time they spent using the mindfulness strategies.

Inclusion/ Exclusion Criteria

Table 1: Inclusion and Exclusion Criteria

Inclusion Criteria	Exclusion Criteria
Age 18 years or older	Non-OT students
Currently enrolled in undergraduate or graduate OT coursework/ program at the university where the research was conducted**.**	No untreated cognitive, behavioral, or neurological impairment(s) that could affect participants ability to comply with the demands of the intervention, such as untreated severe depression, attention-deficit hyperactivity disorder, or other can condition that can result in pathologically impaired attention.
English speaking	

Data Collection and Analysis

Data collection was completed using an electronic form of the PSS. An electronic version of the PSS was created using Google Forms so the responses could be easily uploaded into Google Sheets and transferred into Excel to be analyzed. This also allowed for demographic information, such as gender and curricular level in the program to be included for data analysis. A paper-pencil sign-in sheet with participant e-mails was collected during the presentation in order to send follow-up emails and the post-test. Each participant created a unique identifier

during the pre-test (their birth month and last four digits of their phone number) to keep the identity of each participant private but allow for pre- and post-test data comparison.

After six weeks, the post-test questionnaire was e-mailed by the student researcher to the e-mail address provided by each participant. The post-test used the same electronic version of the PSS. All data was then organized into spreadsheets using the unique identifiers created by the participants during the pre-test and entered again during the post-test. There are seven items on the PSS rating scale that need to be scored in reverse direction. These scores were reversed by hand by the student researcher. The primary researcher's faculty mentor also received a copy of the original data to check that no errors were made when reversing the value of the designated items on the rating scale. Once data was entered into spreadsheets, the data was analyzed using a free data analysis software program (i.e., Jamovi). Nominal data on gender and curricular level were assigned numerical values (e.g., 1= female, 2= male).

Pre- and post-test PSS score totals were compared using a paired sample t-test. P-value was used to determine if the difference between pre- and post- test scores was statistically significant and not just due to chance. Significance was pre-specified at the $p<0.05$ level. ANOVA was conducted as a secondary analysis to test for possible relationships between curricular level, gender, and PSS score change.

Outcome Measures and Validity

The PSS is an easy-to-use, reliable, and valid self-assessment tool that asks participants to rate how often they felt a certain way on a variety of items in the last month (Cohen et al., 1983). The PSS has adequate test-retest reliability (.55) for a six-week pre- and post-intervention period (Cohen et al., 1983). The 14 item self-assessment asks questions about perceived stress in daily life over the past month (e.g., *how often have you been upset because of*

something that happened unexpectedly? and *how often have you found that you could not cope with all the things that you had to do?*). The participants are asked to rate these items on a scale of 0-4 with 0= never; 1= almost never; 2= sometimes; 3= fairly often; and 4= very often (Cohen et al., 1983). The PSS version used in this study was the PSS-14.

Previous randomized controlled research by Champion et al. (2018) in a sample of 62 adults representing the general population reported significant improvements in PSS scores associated with brief mindfulness training. More specifically, only the intervention group showed a significant ($p< 0.05$) intervention-related mean decrease in PSS score after ten days, with baseline mean of 16.90 (SD 4.86) and 10-day post mean of 14.90 (SD 4.89). In keeping with this research, power analysis for the present study was conducted using Minitab 21 software package, with target decrease set at 2; standard deviation of the difference set at 4.87 with an assumed correlation coefficient = 0.5; alpha level set at .05; and power at .80. In turn, the total sample size required to show significance was determined to be $n = 39$. To account for an anticipated 10% dropout rate, recruitment for the present study was set at $n = 43$.

Ethical Considerations

Prior to study inception, the author completed human subjects research training through the Collaborative Institutional Training Initiative (CITI). The final research proposal was submitted to and approved by the Institutional Review Board (IRB) at the institution where the study took place.

The author obtained informed consent from all participants in keeping with IRB-approved procedures, including signature of the consent form and continually ensuring that those who enrolled did not feel coerced into participating in the mindfulness training and/or completing the pre- and post-test. Further to this end, voluntary participation was explained to

faculty advisors of student groups, mentioned on the recruitment flyer, and within the informed consent document. All participants were informed that they could stop participating in the consent process or any other research procedure at any time, without penalty. The recruiting flyer shared with potential participants had a link to the informed consent document, which helped ensure adequate time for their review of the informed consent documentation prior to enrollment. Contact information for the research team was on the recruiting flyer so potential participants could reach out with questions. The informed consent document was summarized by the student researcher at the start of the in-person presentation; the student researcher also answered any questions potential participants had at that time.

Participants were informed prior to participating in the presentation and during the consent process that the risks of participating in this study were minimal. The primary risk anticipated was that participants could experience frustration, upset, or anxiety when answering questions about stress in the pre- and post- test or when trying to incorporate mindfulness techniques into their daily routine. Via the informed consent document, participants were made aware that if they experienced distress that they felt was related to research procedures, they should contact their primary care physician as well as the faculty mentor and student researcher. Participants were also provided with contact information for the university's counseling center.

The privacy of the participants and the confidentiality of their responses was also ensured throughout the study. To dissociate names from responses but ensure pre- and post-test data could be compared, each participant created a unique identifier that did not reveal any identifying information to the researcher. All electronic data was collected and stored in the student researcher's password-protected cloud account. The data was then downloaded onto the student researcher's password protected computer. An encrypted email containing the research

data was also sent to the faculty mentor. The faculty mentor then downloaded the data onto her password-protected computer. Only IRB authorized personnel, including members of the research team, had access to the data throughout the research process. Participants were informed that all data/ responses would be maintained for three years after the completion of the study and at the end of this period, computerized records would be deleted.

Timeline of Project Procedures

Table 2: Timeline of Project Procedures

Project Procedure	**Timeline**
IRB Submission	12/2/2022
Initial contact with student association faculty	November 2022
Initial recruitment email to student group faculty	2nd week of January 2023
Mindfulness Presentation and pre-test	End of January 2023; beginning of February 2023
Follow-up emails	1x/ per week following initial presentation
Post-test distribution	Six weeks following initial presentation
Data Analysis	April 2023
Dissemination of Research (Final Paper/Presentation)	May 2023

Section 4: Results and Discussion

Results

The study recruitment period occurred from January 24th, 2023, through February 2nd, 2023. The study period from enrollment through final data collection was January 24th, 2023 to March 31st, 2023. Table 3 shows the demographics of the sample.

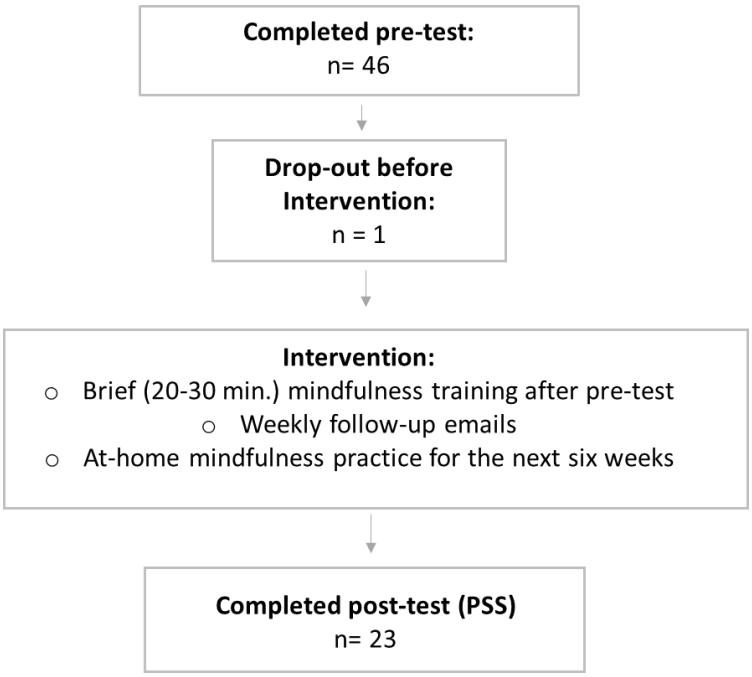
Table 3: Demographic Information

	Enrolled *n* =	Completed *n* =
Undergraduate students	36	16
Female	35	16
Male	1	0
Graduate students	10	7
Female	9	6
Male	1	1

Note. Demographics are shown for those who enrolled in the study as well as those who completed all research procedures per protocol.

Figure 1 summarizes the study flow.

Figure 1: Study Flow



Note. Dropout before intervention was due to an invalid email address provided by the subject (i.e., no further contact was possible). Weekly follow-up emails and the post-test were sent to 45 participants, 23 of whom completed the post-test.

Table 4 summarizes descriptive results on the PSS. Table 5 shows the results of the paired sample t-test.

Table 4: Perceived Stress Scale (PSS) Descriptive Results

	n =	Mean	Median	Standard Deviation (SD)
Pre- test	23	28.3	27	8.04
Post- test	23	23.7	25	7.68

Note. *There was a 4.6-point mean decrease in overall PSS scores.*

Table 5: Paired Sample T-Test

			95% Confidence Interval			95% Confidence Interval	
p	Mean Difference	SE Difference	Lower	Upper	Effect Size	Lower	Upper
0.007	4.65	1.57	1.40	7.90	0.619	0.166	1.06

Note. Because results were significant at $p<0.05$, the null hypothesis was rejected in favor of H_a $\mu_{\text{Measure 1 - Measure 2}} \neq 0$. There was a medium effect size (Cohen's d).

ANOVA revealed no significant interactions (p=0.056) between PSS score change and curricular level and/or gender.

Discussion

The existing evidence base for the present study was sparse regarding the impact of mindfulness on OT students' perceived level of stress. Only one study used a sample composed strictly of OT students' and used the PSS following mindfulness intervention (i.e., Palase et al., 2019). Results did not show a significant difference between pre- and post- test scores and the intervention only incorporated the use of body scans and mindful breathing (Palase et al., 2019).

In contrast, the results of the present study indicated that brief and informal training and education on an array of mindfulness strategies designed to be incorporated into daily life can have a significant impact on OT students' PSS scores. Thus, it is the first study to show that brief and informal mindfulness training and education can help decrease perceived levels of stress in OT students. Design features of the intervention may have driven this benefit. These features are discussed in more detail below.

Research has indicated that the wider the appeal of the mindfulness training, the more potential there is for students to engage in mindfulness practice and that students are more likely to participate when techniques are presented as optional (McConville et al., 2017; Aherne et al., 2016). Additionally, OT students preferred informal mindfulness training during daily activities to formal meditation (Stew, 2011). With this evidence in mind, the intervention for this capstone project was designed to be brief and informal and provide a variety of mindfulness techniques so that students could choose which techniques and strategies to incorporate into their daily life. Some examples of the mindfulness techniques that were presented were setting intentions, mindful breathing, mindful listening, and mindful walking.

Another feature of the intervention design was the use of weekly follow-up emails to provide continuing support to the participants throughout the six-week intervention period. The emails were designed to provide reminders to use the mindfulness techniques that were presented and suggest various ways of incorporating them into their every day. Many of the MBIs previously researched in the college student population involved weekly in-person follow-up meetings. The purpose of the follow-up emails in the present study was to decrease the number of times that participants had to commit to coming to campus, and thus enhance the appeal of the intervention. Although the current study did not measure the appeal of the intervention, the

elements of the intervention discussed above were thought to be more appealing to the target population.

In a study by Poleshuck et al. (2020), OT undergraduate students reported that their highest ranked stressors fell into the categories of *academics* and *time management*. This evidence bolsters the potential real-world value of the results of the present study, which was designed according to the idea that OT students do not need to find additional time for mindfulness in their already busy and hard-to-manage schedules. Instead, they can use the mindfulness techniques presented within activities they are already completing throughout their day, such as when they are walking to class, waiting for class to begin, or while eating lunch.

Limitations

There was potential influence of confounding variables that are difficult to control among college students. For example, a student's stress level may be influenced by personal tragedy during the semester, diet, level of physical activity, and "buy-in" to the idea of mindfulness. As the present study was not designed to measure these variables, it remains unknown whether they had an impact on post-test PSS scores. Other limitations were the use of a convenience sample from a single university OT program as well as the small sample size for final analysis. The student researcher took steps to ensure the study was adequately powered by conducting a sample size calculation. The drop-out rate was 50%, which exceeded the pre-specified, anticipated 10% rate. Although the weekly follow-up emails were a strategy to combat attrition, there were no accountability measures to determine how often the students used the mindfulness techniques. It is also unknown if participants who did not complete the post-test did not

participate in mindfulness activities throughout the six weeks or if they simply chose not to complete the post-test.

A final limitation that may have affected outcomes was the timing of the presentation and intervention. Because the initial presentation was given within the first two weeks of the spring semester, some participants received their first invitation to complete the post-test over spring break. This timing could have interfered with response rate even though multiple follow-up email reminders were issued thereafter. The timing relative to spring break could also have influenced the students' perceived level of stress.

Future Research

Future research should continue to examine the impact of brief and informal mindfulness training and education on OT students' perceived level of stress. Mixed-methods research could build on the results of the present study by examining students' opinions of the intervention's appeal, the feasibility of strategies presented, and preference of strategies used. This information could further optimize the intervention by determining what mindfulness techniques have the most appeal, which techniques the students prefer, and what techniques they use most often following the intervention. It would also be helpful to examine mindfulness and OT students' stress levels over a longer period, such as an entire semester. In addition, this small-scale study could be replicated using other OT programs from universities across the country. Results could also help promote continued research on the connection between mindfulness and OT students' overall mental health.

As mentioned previously, this capstone project was guided by the OA model, in hopes that the student researcher could help facilitate students' ability to adapt to stressful situations. While the impact of the intervention on occupational adaptation was not studied, the promising

results of the present study could serve as part of a rationale for future studies of whether mindfulness improves occupational adaptation.

Clinical Implications

By exposing students to a variety of mindfulness strategies that they can incorporate into activities they are already completing in their daily lives, this study helped to show that mindfulness can be a valuable tool used for the management of stress among students and future clinicians. Based on the present study, it is reasonable to anticipate that students continued use of mindfulness strategies may help them adapt, cope, and deal with everyday stressors more easily.

Knowledge gained from this study could also be used to help lead university programs to incorporate mindfulness techniques into coursework as a tool to promote the mental health and well-being of their students. It may also help inform the creation of educational programs designed to enhance OT students' ability to deal with stressors while completing demanding course work and while on their fieldwork placements. If universities can produce OT students that are better able to cope and adapt to stressors in the educational setting, it may better prepare them to cope with stressors within the professional healthcare setting.

Conclusion

This capstone project studied whether OT students' stress was impacted by a brief and informal mindfulness training designed to educate them on a variety of mindfulness strategies to incorporate into existing daily activities. The results of the study expanded upon the sparse evidence base regarding mindfulness and PSS-measured stress in OT students and is the first to show that brief and informal mindfulness training can have an impact on their perceived stress.

These results may be used by universities seeking to incorporate mindfulness techniques into OT coursework and/or as a tool to help promote the mental health and well-being of their OT students. Results could also open the door for more extensive research regarding the impact of mindfulness on fieldwork and professional performance. Continued research using a mixed-methods approach is recommended to help optimize the intervention based on students' preferences.

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Appendices

Appendix A

IRB Approval Letter

Hello Emily Masters,

Congratulations! Using expedited review procedures, the Institutional Review Board at Eastern Kentucky University (FWA00003332) has approved your study entitled, "Impact of Mindfulness on OT Students' Stress." Your approval is effective immediately and will expire on 12/31/23.

As the principal investigator for this study, it is your responsibility to ensure that all investigators and staff associated with this study meet the training requirements for conducting research involving human subjects, follow the approved protocol, use only the approved forms, keep appropriate research records, and comply with applicable University policies and state and federal regulations. Please read through the remainder of this notification for specific details on these requirements.

Consent Forms: If your study involves only adult subjects, a copy of your approved informed consent form is attached. If your study includes children as subjects, copies of the approved parent/guardian form and child assent form(s) are attached. Please ensure that only approved documents with the EKU IRB approval stamp are used when enrolling subjects in your study. Each subject must receive a copy of the form to keep, and signed forms must be kept securely on file in accordance with the procedures approved in your application. At any time, you may access your stamped form(s) through your InfoReady Review account by following the steps below:

1. Log in to your InfoReady Review account using your EKU credentials.
2. Click the Applications link from the top menu bar.
3. Select the project title for your study.
4. Access the approved PDF file from the list of attachments.

Adverse Events: Any adverse events that occur in conjunction with this study should reported to the IRB immediately and must be reported within ten calendar days of the occurrence.

Research Records: Accurate and detailed research records must be maintained for a minimum of three years following the completion of the study. These records are subject to audit. If you are an EKU student, you are responsible for ensuring that your records are transitioned to the custody of your faculty advisor at the end of your study. Records include your approved study protocol, approval notification, signed consent forms and/or parent/guardian permission and assent forms, completed data collection instruments, other

data collected as part of the study, continuing review submissions and approvals if applicable, protocol revision requests and approvals if applicable, and your final report.

Changes to Approved Research Protocol: If changes to the approved research protocol become necessary, a Protocol Revision Request must be submitted for IRB review, and approval must be granted prior to the implementation of changes. Some changes may be approved by expedited review while others may require full IRB review. Changes include, but are not limited to, those involving study personnel, consent forms, subjects, data collection instruments, and procedures.

Final Report: Within 30 days from the expiration of the study's approval, a final report must be filed with the IRB. A copy of the research results or an abstract from a resulting publication or presentation must be attached. If significant new findings are provided to the research subjects, a copy must be also be provided to the IRB with the final report. To submit your final report, please follow the steps below:

1. Log in to your InfoReady Review account using your EKU credentials.
2. Click the Applications link from the top menu bar.
3. Locate your study and click the Progress Report icon in the far right column.
4. Complete the information fields and attach copies of any required documents.
5. Click the Finalize button to submit your report. This button is located just above the attachment fields.

Registration at ClinicalTrials.gov: If your study is classified as a clinical trial, you may be required by the terms of an externally-sponsored award to register it at ClinicalTrials.gov. In addition, some medical journals require registration as a condition for publication. In the case of journals with membership in the International Committee of Medical Journal Editors, clinical trials must be registered prior to enrolling subjects. It is important that investigators understand the requirements for specific journals in which they intend to publish. In the case of sponsored project awards, timeline requirements will vary for awards that require registration. Approved consent forms must be uploaded in the system for all Federally-funded clinical trials after subject enrollment has closed, but earlier registration is not required for all agencies. If you have questions about whether a sponsored project award requires registration and on what timeline, please send an email to tiffany.hamblin@eku.edu before beginning recruitment so that the specific terms of the award can be reviewed. If you have a need to register your study and do not have an account in the system, please send an email to lisa.royalty@eku.edu and request to have a user account created.

If you have questions about this approval or reporting requirements, please contact the IRB administrator at lisa.royalty@eku.edu.

For your reference, comments that were submitted during the review process are included below. Any comments that do not accompany an “I approve” response have been provided to you previously and were addressed prior to the review process being completed.

Appendix B

EASTERN KENTUCKY UNIVERSITY

Research Volunteers Needed

The Impact of Informal Mindfulness Training on Occupational Therapy Students' Perceived Level of Stress

You are being invited to take part in a study about mindfulness. Mindfulness can be defined as paying attention, on purpose, to the present moment with an attitude of nonjudgement. The researchers would like to see if a brief educational training on mindfulness has an impact on your level of stress. If you are an OT student you may be eligible to participate.

Participation is voluntary and you may withdraw from the study at any time.

Please scan the QR-code to view the Informed Consent Document

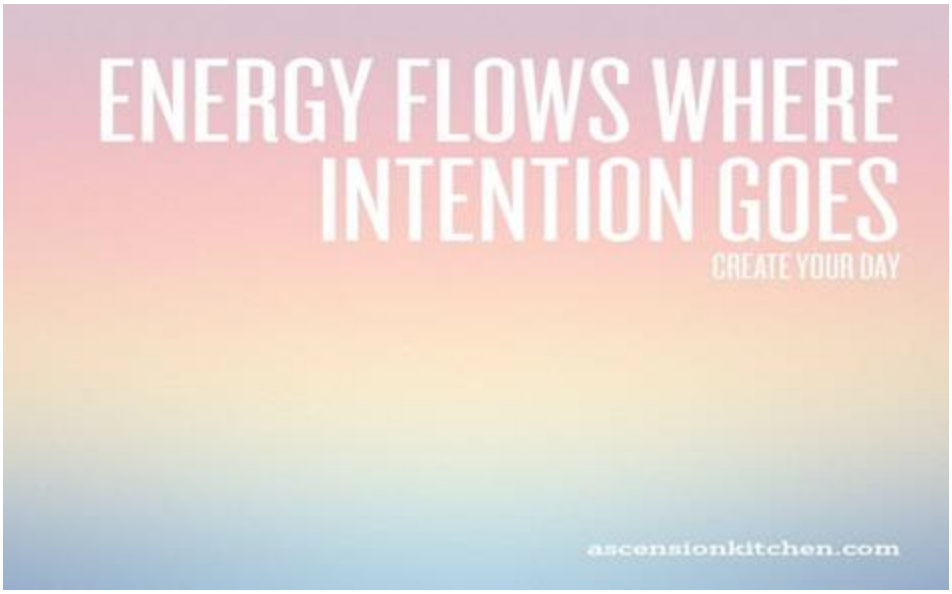
For more information, please contact:
Emily Masters, OTD student
emily_masters2@mymail.eku.edu

Appendix C

Weekly Follow-up Emails

Week 1 - Intentions

An **intention** is a guiding principle for how you want to be, live, and show up in the world. Setting an intention can be a powerful practice, as it reinforces what we want for ourselves and gives direction and meaning to our day. During this upcoming week, try to take a minute or two each day to set an intention. Some examples are listed below.



- *My intention is to practice more gentleness and non-judgment when I notice myself getting frustrated or stressed.*
- *My intention is to bring joy to others.*
- *My intention is to be gentle with myself while I practice self-care.*
- *My intention today is to be open to new ideas.*
- *My intention is to take a mindful breath before I enter the classroom.*

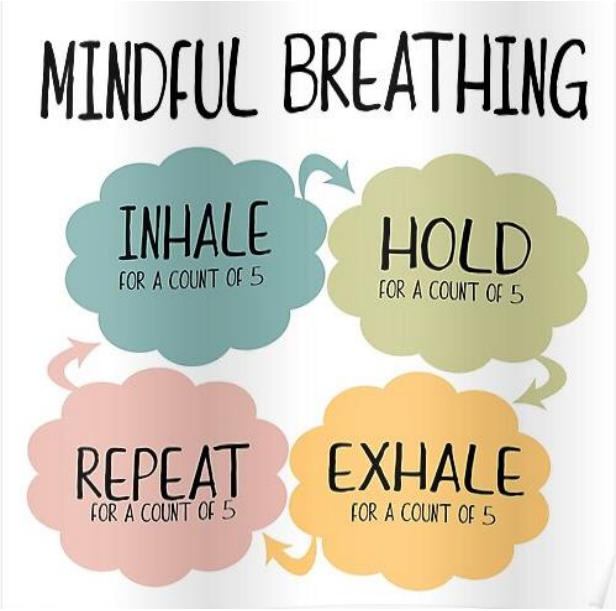
I have also included a PDF copy of my presentation in case you would like to look back and refer to the strategies or resources that were provided. Thank you again for your participation!

Reminder: if you would like a copy of the Informed Consent form you signed, please see Dr. Cheryl Carrico and she will provide it to you.

Thank you,
Emily Masters

Week 2- Intentional Breaths

Pressing pause to take 3-5 **intentional breaths** is an easy way to practice mindfulness. This can be done multiple times throughout the day, prior to starting class or an assignment, when you notice yourself becoming overwhelmed or stressed, or when transitioning from one location or activity to another. When taking deep breaths, find a part of the breath to focus on – the sensation of the air flowing through your nose or down your throat, the rise and fall of your chest, the expansion of your stomach, or the sound of your breathing. If your mind begins to wander, gently bring yourself back to the sensation of the breath.



Try this 5-minute guided Body Scan on YouTube:

Use your [Smart] Watch to practice mindful breathing:

1. Open apps on your [Smart] Watch
2. Tap the Mindfulness App
3. Tap *Breathe*
4. Inhale slowly as the animation grows, then exhale as it shrinks.
5. Tap "…" to set a duration (you can choose anywhere from 1 to 5 minutes)
6. Open the *Settings* app to set mindfulness reminders throughout the day.

Thank you,
Emily

Week 3- Mindful Listening

Take a moment to pause what you are doing and tune into the sounds you are hearing at this moment. The hum of the lights… your feet on the pavement… the song coming through your headphones… the sound of cars driving past… footsteps in the hallway… typing on a keyboard… birds chirping in the distance. Whatever it is you are hearing, allow yourself this moment to be fully present.

Another way we can be mindful is during conversation. It is sometimes said that most people listen not to hear you, but to be able to respond. Next time you are having a conversation with someone, try to actively listen to understand versus listening to respond. By practicing active listening skills, you can train your mind to tune into what others say and try to really understand it.

Enjoy these nature sound videos from YouTube. Try putting one of these on the next time you are looking for some background noise.

Beach waves:

Mountain stream:

Thank you,
Emily

Week 4- Mindful Walking

This week, spend time focusing on your **walking**. Mindful walking is different from leisure walking and can be practiced through the day. Mindful walking involves focusing closely on the physical experience of walking and paying attention to the specific components of each step.

Try to notice these things to help you walk mindfully:

- *Lift your back foot totally off the ground;*
- *Observe the back foot as it swings forward and lowers;*
- *Observe the back foot as it makes contact with the ground, heel first;*
- *Feel the weight shift onto that foot as the body moves forward and you lift your other foot.*

You may also pay attention to the swing of your arms, your posture, and the feel of the ground beneath each foot. Try to also relax your brow and your jaw, release/ drop your shoulders, and relax your fingers and hands.

Thank you,
Emily

Week 5- Self-compassion

"With **self-compassion**, we give ourselves the same kindness and care we'd give to a good friend." – *Kristin Neff*

Research indicates that self-compassion can be one of the most powerful sources of coping we have available to us, which can drastically improve our mental and physical wellbeing. According to Neff, self-compassion is the process of simply turning compassion inward. Self-compassion involves being kind and understanding rather than harshly critical when we fail, make mistakes, or feel inadequate. We need to give ourselves support and encouragement rather than being cold and judgmental when challenges arise in our lives.

(Neff, K. 2023 - https://self-compassion.org/)

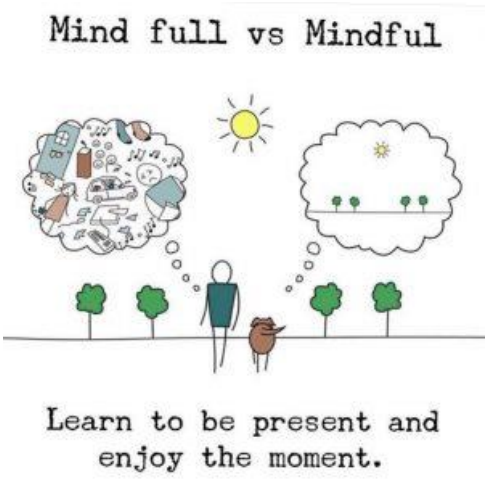
Please view this six-minute video from Dr. Kristin Neff speaking on the three components of self-compassion. Dr. Kristin Neff is the world's leading researcher on self-compassion.

Thank you,
Emily

Week 6- General info/ post-test

Thank you again for your participation in this study. I hope you found the strategies useful and will continue to incorporate them into your every day. Please take 3-5 minutes to fill out the **post-test** *Perceived Stress Questionnaire.* Remember, rate your stress levels honestly based on how you felt during the past month.

https://forms.gle/QsHuHstFnUoKWMX69



"Mindfulness is not hard; we just need to remember to do it." – Sharon Salzberg

Thank you and best of luck as you continue through the OT program!
Emily Masters

Follow-up- Reminder

Hello!

This is a reminder to take 3-5 minutes to fill out the **post-test** *Perceived Stress Questionnaire.* Remember, rate your stress levels honestly based on how you felt during the past month.

https://forms.gle/QsHuHstFnUoKWMX69

Thank you for your participation and helping me complete my capstone project!

Emily Masters