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EASTERN KENTUCKY UNIVERSITY

Integrating Mindfulness- Based Practice into University Curriculum: Building Resilience Among
Undergraduate Health Science Students

Honors Thesis

Submitted

in Partial Fulfillment

of the

Requirements of HON 420

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By

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Mentor

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Integrating Mindfulness- Based Practice into University Curriculum: Building Resilience Among
Undergraduate Health Science Students

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Abstract:

Health science majors are both physically and emotionally demanding educational pathways with high expectations. These difficult fields of study place students at risk for stress-related illness, such as anxiety and depression. Many health science students are expected to succeed in their educational programs and provide care for others, despite the mental challenges they face daily. These psychological factors are continuously pushing this population of students to seek treatment for their mental well-being. A large body of assessment literature suggests that mindfulness can be used as a practice to relieve stress and enhance the mental well-being of undergraduate college students. Studies show that using mindfulness-based practices can help alleviate the stress and negative emotions these students experience both inside and outside the classroom. Mindfulness, in this aspect, can be used to achieve a clear mind and optimal mental stability. This integrative practice is efficient in symptom reduction and aims to improve overall psychological well-being. As a result of improved mental health within this population, students can metacognitively provide quality care in their clinical settings, while also meeting educational demands in their studies. With the implementation of mindfulness-based practice in the university setting, is expected to increase mindfulness and resilience levels. This study aimed to determine if an in-class mindfulness intervention in a sample of first-year undergraduate health science students in the university setting will elicit powerful changes for pre-healthcare

undergraduate students and will be helpful in the development of their clinical careers, in terms of resilience.

Keywords: mindfulness, mindfulness-based intervention, mindfulness-based stress reduction, undergraduate students, health science students, mental health, mindfulness, resilience, nursing students

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Integrating Mindfulness-Based Practice into University Curriculum: Building Resilience Among Undergraduate Health Science Students

Background and Significance

Chronic stress is highly prevalent in college students, with lasting effects on their mental, emotional, and physical health. College students are faced with a multitude of daily stressors, contributing to an increase in anxiety and perceived stress. This heightened stress can be attributed to a variety of facets including high academic demands, financial concerns, and personal challenges. These stressors place a significant strain on overall well-being and raise a growing threat to public health. Students enrolled in pre-health care programs are placed at a higher risk for developing depression, chronic anxiety, and stress-related illnesses (Long, 2021). There is evidence that the increased persistence in anxiety among this population can lead to serious consequences. One in six students report acute suicidal ideation and lower levels of academic engagement and performance (Akeman, 2020).

With the addition of generalized concerns that students face, health science majors face pressures such as: fear of failure, meeting professional and clinical demands, and insecurities related to clinical competence. Alongside these factors, many health science students are faced with specific responsibilities directly related to their field of study. Healthcare students not only spend time in the classroom, but also outside the university setting at clinical rotations and volunteer activities. This population of students are tasked with succeeding within their educational programs while simultaneously caring for the well-being of others. These circumstances add a tireless amount of workload pressure and emotional conflict by being exposed to human suffering within the world of health care (Burgstahler, 2020).

With the increasing number of college students reporting escalated levels of stress and anxiety, the demand for college counseling services exceeds the capacity to adequately meet the needs of all students. In response to the increase in mental health challenges in undergraduate students, many institutions have been integrating programs that promote mental well-being through means of mindfulness and stress reduction (Mitchell, 2021). These programs are designed to provide students with mechanisms to positively approach their daily stressors, while targeting the overarching goal of instilling effective coping skills (Mason, 2021). Most applied practices are those that could be easily incorporated into a daily routine, accessible to student life (Nardi, 2022). Although a vast number of anxiety/stresses reducing techniques exist, Mindfulness Based Stress Reduction (MBSR) and Mindfulness-based interventions (MBIs) are highly effective, evidence-based approaches that are efficient in symptom reduction in both clinical and non-clinical populations. These practices have been shown to increase emotional self-regulation and feelings of executive control (Long, 2021). This mindfulness-based practice should serve as a preventative and protective skillset for combating burnout in their future professions and academic careers (Martinez, 2021). Literature suggests that mindfulness practice not only improves overall mental wellness but may also increase resilience and compassion. Both these are important issues for health science students at the university level as well as later when they must maintain patient-provider relationships (Burgstahler, 2020). The accumulating evidence across all health and social care professional training suggesting that mindfulness can reduce stress, depression, and quality of life. All of which would support its inclusion in health care education (Crowther, 2020). A student's perception of stressors and their capacity to effectively manage them is a legitimate concern for their clinical performance and capacity to care for patients (Delany, 2015).

The purpose of the present pilot is to examine the effects of guided mindfulness practice on a convenience sample of undergraduate first-year health science students. Evidence suggest that. These improvements particularly occur when students engage in informal mindfulness practice compared to formal practice (Kokoschka , 2021). This evidence-based intervention aims to explore the effectiveness of classroom evidence-based mindfulness teaching and improved student mental well-being. This study will focus on the benefits of improving mental wellness, as well as recognize associated themes such as increased resilience and self-compassion. Identifying the effective dose of mindfulness practice in the university setting will elicit powerful changes for pre-healthcare undergraduate students and will be helpful in the development of their clinical careers.

Methodology

A systematic review of literature was performed in April 2023 using the following databases: EBSCO Host, CINAHL Ultimate, Psychology and Behavioral Science Collection.. The following key terms were selected for inclusion in the review: ‘mindfulness,’ ‘mindfulness-based intervention,’ ‘mindfulness-based stress reduction,’ ‘undergraduate students,’ ‘health science students,’ ‘mental health,’ ‘mindfulness,’ ‘resilience,’ ‘nursing students.’ The outcomes of meditation and mindfulness-based research were analyzed to determine the impacts these practices have on reducing stress among professional nurses. The research that was evaluated included systematic reviews and quantitative studies. Studies were excluded from the literature if they did not include an evaluation of the proposed methods.

Review of Literature:

Burgstahler (2020) expands on the effects of mindfulness in pre-health care undergraduate students. This article provides a background demonstrating the need for

mindfulness-based stress reduction in this population. This article describes the various intrapersonal stressors that health care students face daily including academic performance, pressure to succeed, financial concerns, quality of sleep, and relationships with friends and family (Burgstahler, 2020). Not only do health science students bear the weight of typical college stressors, but they also face the challenge of caring for others as well. This article highlights the ever-growing mental health crisis and demonstrates the need for accessible and viable approaches to stress reduction for pre-healthcare students. In the Spring 2018 American College Health Association-National College Health Assessment, students from across the United States reported feeling overwhelmed (88.1%), hopeless (55.0%), very lonely (64.4%), and even contemplated suicide (13.0%). These statistics, along with voice of concern throughout college campuses nationwide, confirm the further need for a solution in terms of improving mental wellness among the student population (Burgstahler, 2020).

Participants in Burgstahler's study were recruited from two courses required for all pre-healthcare students at the university. A total of 171 students were recruited and selected for participation in this study. All participants were asked to complete an 8-week mindfulness meditation intervention. The mindfulness intervention consisted of an online guided course, which provided an educational and informational introduction to the practice. of mindfulness meditation. The guided mindfulness assignments were posted daily, Monday through Friday, and were timed at 5-12 minutes each day. This intervention and the data collected was over a course of 8 weeks.

Burgstahler's research relied heavily on the data collected through participant surveys. A week before the mindfulness intervention, participants completed four surveys including the Perceived Stress Scale (PSS), the State-Trait Anxiety Inventory (STAI), and the Five Facet

Mindfulness Questionnaire (FFMQ). After the intervention was implemented, Burgstahler collected the post intervention data by reassessing the variables measured prior to the mindfulness administration. Another assessment was added to evaluate participant experience, which consisted of questions that aimed to gather qualitative data surrounding the participants' individual experiences with mindfulness and how likely they were to use it again in the future. The Mindfulness Meditation Experience Questionnaire showed that investigated participant 71.1% of participants found the 8-week intervention “very beneficial,” “somewhat beneficial,” or “beneficial” compared to “minimally beneficial” or “not beneficial”., there was a significant difference between the pre- and post-intervention for all variables that were being measured (HRV, PSS, STAItr, FFMQ). All data were broken down into quartiles and presented as means \pm standard deviation of the mean. Examining the data, it can be concluded that as the amount of time participating in mindfulness increased, the significant variable across the four groups decreased accordingly. The Perceived Stress Scale (PSS) scores indicated a decrease from pre to posttest from 19.91 ± 5.20 to 15.97 ± 4.58 . Similarly, the STAI trait showed a decrease from 42.06 ± 10.31 to 37.70 ± 9.86 . The quantitative data collected from this study, as well as the positive feedback from the experience questionnaire suggest a positive relationship between mindfulness practice and health science students, as well as an indication that a shortened MBSR course serves as a viable approach to help treat the current mental health concerns.

Dawson's meta-analysis provides insight into the correlation between mindfulness-based interventions and stress in college students. The author demonstrates undergraduate students as being at a heightened risk for mental illness, due to the contributing factors of high academic demands, unfamiliar environments, and new social pressures. This article expands on the statistical data showing an increase in student's perceived stress and an increase in requested

support of mental health services on campus. Current theoretical frameworks suggest that mindfulness training produces changes in the structure of certain brain regions that are involved in emotional regulation, sensory awareness, and self-awareness (Dawson, 2020). This research focuses on the fact that mindfulness is already being implemented into university curriculums globally but aims to determine the effectiveness of mindfulness interventions through a systematic review and meta-analysis of randomized controlled trials.

The author gathered data through a comprehensive systematic review and meta-analysis of randomized controlled trials. A systematic search of articles published up until March of 2017 was conducted in the following five databases: CENTRAL, CINAHL, EMBASE, PsycINFO and MEDLINE) and three grey literature databases: PROQUEST, ETHOS and Google Scholar). Of those trials, 51 were selected for inclusion in this study. The studies included in the systematic were grouped into each meta-analysis subset with account of four characteristics of the included studies: (1) Control group (passive versus active); (2) Type of study (single-session “lab-based” study versus multisession “course-based” study; (3) Outcome measures; and (4) Length of follow-up (three months or less after the conclusion of the intervention, versus more than three months).

The results of the meta-analysis of systematic reviews demonstrate that course-based Mindfulness Based Interventions (MBIs) with passive controls, significantly reduced levels of distress, depression, anxiety, and rumination, and well as improved well-being in the undergraduate student population. Not only did the results indicate a positive response to the mindfulness interventions on a short-term basis, but long-term reductions in distress were also found. Evidence showed that the therapeutic effects lasted beyond three months, significantly improving distress and state anxiety, and emotion regulation.

Vilven (2019) aimed to create a mindfulness intervention that taught college students a variety of mindfulness practices intended for them to use as a coping mechanism for acute and chronic stressors. The theoretical framework behind this study design aimed to give students multiple mindfulness strategies in that they could choose the one they value. This framework follows the social learning theory and expectancy value theory of motivation. The social learning theory suggests that individuals learn from each other by modeling, observing, and imitating. In comparison, the expectancy value theory of motivation demonstrates that whether one engages in an activity will depend on the degree to which they “expect” to enjoy participating in the activity and the value they place on the activity.

In Vilven’s study, a practitioner action research study design was used to explore how incorporating contemplative mindfulness practices into the university classroom could affect students mentally. The data was gathered from 32 consenting students who were gathered from students enrolled in this Personal Health course offered at a regional campus of a large Midwestern University. Students were asked to engage in mindfulness activities throughout the semester, which included a variety of activities such as mindful breathing, body scan exercises, concentration exercises, and visualization. The goal of this study was to include multiple strategies to appeal to each individual student.

The data collected included both a pre- and posttest survey with qualitative and quantitative questions, as well as a response to in-class and data from a group-level assessment (GLA) conducted at the end of the course. Quantitative data was collected and analyzed by grouping the five-factor groups: interest and utility, anxiety, intellectual accessibility, fear, and emotional satisfaction. Statistical tests were performed by running a series of paired-sample t tests using SPSS to compare participants’ mean test scores from the end of the semester to the

scores at the beginning of the semester. The results of the surveys indicate that emotional satisfaction was significantly increased because of mindfulness. Although the results were not as significant for the other factors investigated, there were strong correlations that indicated a positive shift in the students' attitudes toward mindfulness at the end of the semester.

Rababah's study "The association between mindfulness and health promotion in undergraduate nursing students: A serial multiple mediator analysis was conducted to examine the association between mindfulness and health promotion among a population of university nursing students. The present study focused on the exploration of the therapeutic effect that mindfulness had on the following factors: perceived stress, depressive symptoms, self-care agency, and impulsivity (Rababah, 2020). This study was conducted using a cross-section quantitative approach and was carried out by a large university in Jordan. 195 undergraduate nursing students were invited to participate in this study. After IRB (Institutional Review Board) approval, participants were instructed to complete paper-based questionnaires including the Health Promoting Lifestyle Profile II (HPLP II), the Mindful Attention Awareness Scale (MAAS), the Perceived Stress Scale-10 (PSS-10), the Center for Epidemiologic Studies Depression Scale-Revised (CESD-R), Barret Impulsiveness Scale (BIS-11), and the Appraisal of Self-Care Agency Scale-Revised (ASAS-R)..

Pearson's r correlations revealed that mindfulness was positively related to the health promotion of nursing students ($r = 0.26$, $p < 0.001$). Although perceived stress was the only factor that was significantly affected by mindfulness in this study, the serial multiple mediator analyses revealed that three combinations of the mediators made the effect of mindfulness on health promotion more statistically significant (Rababah, 2020). These combinations included: perceived stress and self-care agency, depressive symptoms and self-care agency, and perceived

stress with depressive symptoms and self-care agency. This study left further implications for future research pertaining to how mindfulness-based interventions should include strategies that mitigate stress and depressive symptoms and improve the self-care agency (Rababah, 2020).

Vidic's article provides a background expanding on the current climate of mental health among college students. The argument of this article is that mindfulness practice produces positive benefits on the overall health and well-being of the college student population. The results of this study provide encouraging results regarding the integration of mindfulness interventions as a part of the academic curriculum. The idea of presenting undergraduate students with positive coping mechanisms like mindfulness poses benefits such as increased awareness, decreased anxiety, and resilience.

This source gathers data from multiple sources, including an in-depth background and review of the literature. In this section, the author presents the importance of taking care of your mental health at the university level and how it can translate to your coping mechanisms later in life. This study also collected data from seventy-one students who were selected to be enrolled in a 7-week mindfulness training program. Participants in the experimental group were enrolled in a 90-minute mindfulness-based relaxation class that met two times per week over the period of 7 weeks. Oppositely, participants in the control group were recruited from three other physical education courses. During the class, students were instructed to practice silence, allowing themselves to observe their breath and conscious thoughts. The students were able to reflect on their experiences for the remainder of the class. Mindfulness practice gradually increased from five minutes to twenty minutes by the end of the course. The course instructor continually emphasized the importance of maintaining an open and nonjudgmental mind during each mindfulness session (Vidic, 2019).

The scales used to collect data included the Perceived Stress Scale (PSS), the Brief Resilience Scale (BRS), the Multidimensional Perfectionism Scale (MPS), and the General Self-Efficiency Scale (GSE). The mixed Way-ANOVA analysis was used to examine the impact of mindfulness intervention and non-mindfulness intervention conditions on these variables. These results indicated that there was a significant correlation effect between the duration of the intervention and the control and experimental groups' perceived stress levels. The results revealed that the experimental group demonstrated larger decreases and lower overall stress levels at the post-test compared to the control group. Similarly, the Brief Resilience scale revealed a strong correlation between the mindfulness intervention and increased resilience levels. The results of this study indicated that even though the experimental group started with lower levels of resilience at pre-test compared to the control group, the experimental group demonstrated larger increases of resilience at post-test. Lastly, the analysis results indicated that there was a statistically significant interaction effect between the time of the intervention and self-efficacy levels. The experimental group started with lower levels of self-efficacy at pre-test but demonstrated larger increases and higher levels of self-efficacy at the post-test (Vidic, 2019). This study aimed to evaluate the correlations between mindfulness and college student's perceived stress, resilience, self-efficiency, and perfectionism. Although the results of this study did not find statistically significant effects on the measures of perfectionism, it did find promising results indicating that mindfulness poses therapeutic effects for college-aged students including decreased stress, and increased measures of resilience and self-efficacy (Vidic, 2019).

Intervention

The purpose of the present project is to examine the effects of guided mindfulness practice on a sample of undergraduate first-year health science students at a rural 4-year

university. This project aims to explore the effectiveness of evidence-based mindfulness teaching in the university setting and improve student mental well-being. This study will focus on the benefits of improving mental wellness, resilience, and self-compassion. The criteria of population chosen for this study will encompass twenty students enrolled in an undergraduate first-year success seminar, GSD 101, at the elected university. The intervention at hand consisted of a brief teaching-style PowerPoint educating the classroom on mindfulness. In this presentation, it will include what mindfulness is, why this practice is significant for the selected population, and how mindfulness is practiced. During the presentation, an evidenced-based guided body scan mindfulness technique will be instructed. Along with this guided practice, students will receive tips and tricks for implementing mindfulness into their everyday lives as undergraduate college students.

Ethical Considerations

Before the intervention, the students enrolled in the study will complete a consent form verified by Eastern Kentucky University's Institutional Review Board as #5348 with an expiration date of 12/30/2023. This document will outline the project and give students all the information they need to know prior to consenting to participate in the intervention. It is important to note that the Institutional Review Board has approved that this project will pose no greater than minimal risk to those who participate. The subject matter will focus on ways of coping with stress using mindfulness, which is not expected to pose any physical, psychological, social, legal, or other risks. The study is voluntary, and participants will be allowed to drop out of the study at any time if they feel as if they are faced with risk. There will be no negative consequences to dropping out of the study. To minimize potential risks, only de-identified survey responses will be obtained. Student participants' identities will not be known to the investigator.

The content of the study will be explained in detail, outlining the procedure prior to the study taking place. Any questions a participant may have will be answered prior to or at any point during the study. If the participant feels the information or activities presented are in any way affecting their quality of life, or causing social, emotional, or psychological distress, they will be referred to a counselor at the EKU counseling center for therapy.

Students will be instructed to fill out two pre-test questionnaires before the PowerPoint including: The Five Facet Mindfulness Questionnaire and The Brief Resilience Scale. The Five Facet Mindfulness Questionnaire, developed by Baer et al., 2006, will be used to measure participants' mindfulness before and after the intervention. It is a 39-item survey that measures observing, describing, acting with awareness, non-judging of inner experience, and non-reactivity to inner experience. Each item is rated on a 5-point scale ranging from 1= 'rarely or never true' and 5 = 'very often or always true.' Subscale scores are obtained by calculating the meaning of responses. The Brief Resilience Scale (Ye et al., 2022) will be used to measure resilience before and after the intervention. This scale aims to determine how likely the participant will bounce back from a difficult situation. The BRS consists of six items. Each item is rated on a 5-point scale ranging from 1= 'strongly disagree' to 5= 'strongly agree. An average score is measured to determine the level of resilience. Students will also be instructed to fill out a demographic survey, developed by the investigator and their mentor. This survey will be useful in allowing the researcher to further understand the background characteristics of the participants regarding the project.

After the PowerPoint and mindfulness lesson is complete, students will be instructed to try this practice on their own. There will be a short YouTube video showcasing a guided body scan mindfulness practice that the students are to complete before coming to the next class. This

will give the participants a chance to practice mindfulness in their own time in their own environment. At the next session, the students will receive the same questionnaires (The Five Facet Mindfulness Questionnaire and The Brief Resilience Scale). Then, the pre-test and post-test questionnaires will be statistically analyzed to show the effect that integrating mindfulness had on the population of students enrolled in GSD 101, in terms of improving mental wellbeing and resilience.

Results

Using the Five Facet Mindfulness Questionnaire (FFMQ) from all 14 students, it can be determined that the overall results of the pre-test were higher than that of the post-test. This statistic was calculated using Cohen's D as the effect size. Cohen's D is an effect size used to indicate the standardized difference between two means. Cohen's d is an appropriate effect size for the comparison between two means, which would be the pre-test and post-test averages. The Cohen's D effect size can be calculated by first calculating the means, standard deviation, and pooled standard deviations of the two means. According to this calculation, the Cohen's D for the FFMQ was -0.087042711. A negative Cohen's D indicates that there was not a statistically significant change from pre-test to post test (Figure 4). Similarly, the Cohen's D for the Brief Resilience scale score has a Cohen's D of -0.104639464. This indicates a non-statistically significant effect from pre-test to post test (figure 7). However, looking at Figure 5, it can be determined that that subscales for the Five Facet Mindfulness Questionnaire (FFMQ) increased significantly. Each subscale (observing describing, awareness, non-judgement, and non-reactivity) were significantly increased from pre-intervention to post intervention.

Figure 1:*Five Facet Mindfulness Questionnaire (FFMQ) Averages from Pre-Test to Post Test*

Participant	Pre:	Post
1	3.58974359	3
2	3.435897436	3.435897436
3	3.230769231	3.564102564
4	2.051282051	3.769230769
5	2.923076923	3.538461538
6	3.461538462	2.128205128
7	3.307692308	2.974358974
8	3.564102564	3.333333333
9	3.153846154	3.666666667
10	3.974358974	2.974358974
11	3.205128205	3.256410256
12	3.743589744	3.076923077
13	3	3.256410256
14	2.128205128	3.384615385

Note. Figure 1 shows the statistical changes in the averages of Five Facet Mindfulness Questionnaire (FFMQ) scores from pre-test to post-test.

Figure 2:

Five Facet Mindfulness Questionnaire (FFMQ) Effect from Pre-Test to Post Test

	Mean	SD	N
Pre-Test	3.197802198	0.547951369	14
Post-Test	3.23992674	0.410084671	14
M1-M2	-0.042124542		
Pooled SD	0.483952549		
Cohen's D	-0.087042711		

Note. Figure 2 shows the effect size (Cohen's D) from the FFMQ scores from pre-test to post-test.

Figure 3:

Five Facet Mindfulness Questionnaire (FFMQ) Subscale Averages from Pre-Test to Post

Test

Average	Observing	Describing	Awareness	Non-Judging	Non reactivity
Pre-Test	2.96	3.06	2.44	2.78	2.78
Post-Test	3.80	3.46	3.0	2.92	2.96

Note. Figure 3 shows the statistical changes in the averages of the Five Facet Mindfulness Questionnaire (FFMQ) sub-scores from pre-test to post-test.

Figure 4:*Brief Resilience Scale (BRS) Averages from Pre-test to Post-test*

Participant	Pre:	Post
1	3.166666667	1.833333333
2	3.333333333	3.666666667
3	3.666666667	3
4	2.666666667	3.833333333
5	4.166666667	3.333333333
6	3	3.333333333
7	2.833333333	1.833333333
8	4	3.333333333
9	1.833333333	2.833333333
10	3.666666667	4
11	3.666666667	4
12	3	3.666666667
13	3.5	4.333333333
14	3.333333333	3.833333333

Note. Figure 4 shows the statistical changes in the averages of Brief Resilience Scale (BRS) scores from pre-test to post-test.

Figure 5:

The Brief Resilience Scale (BRS) Effect from Pre-test to Post-Test

	Mean	SD	N
Pre-Test	3.273809524	0.597741986	14
Post-Test	3.345238095	0.758045975	14
M1-M2	-0.071428571		
Pooled SD	0.682615991		
Cohen's D	-0.104639464		

Note. Figure 5 shows the effect size (Cohen's D) from the FFMQ scores from pre-test to post-test.

Conclusions

College students are faced with a multitude of daily stressors, contributing to an overwhelming decrease in mental health and an increase in anxiety and perceived stress. This perceived stress is significantly increased, especially for students enrolled in pre-health care programs. Along with generalized concerns that students face, health science majors face additional pressures directly related to their field of study. These circumstances add to and contribute to the ever-growing mental health epidemic among college-aged students entirely. From the results and data analysis in this pilot, it can be concluded that the Mindfulness Based Intervention (MBI) that was implemented into GSD 101 did not produce statistically significant results from pretest to posttest using the Five Facet Mindfulness Questionnaire (FFMQ) and the Brief Resilience Scale (BRS). However, the averages on all subscales of the FFMQ (Observing, Describing, Awareness, Non-judging, and non-reactivity) were significantly improved from pre to post intervention.

Limitations

The first limitation to this pilot was the small sample size. This project consisted of 14 students that participated in the intervention. Using a sample smaller than what is considered ideal may increase the chance of a true or false premise (Faber, 2014). Small sample sizes, such as the size used in this project, may undermine the internal and external validity of the research. In comparison, large sample sizes can transform small differences into significantly significant ones (Faber, 2014). From this instance, it can be determined that the sample size of this project might have been attributed to the results yielded and may pose a limitation.

Another limitation to this pilot may have been the fact that it included a convenient sample. A convenience sample is one that is drawn from a source that is electively accessible to

the research and one whose characteristics are relevant to the study (Andrade, 2021). The participants selected for inclusion for the intervention based on the following criteria: enrollment into the specific first-year GSD 101 seminar and enrollment at Eastern Kentucky University as a major falling within the health science category. This project specifically aimed to focus on the effects of mindfulness-based practice on a sample of undergraduate health science students, not the entire population. A limitation could be associated with this convince sample because it was generalized to a subpopulation instead of an entire population. In this project, and many others, it is rarely possible to draw a random sample from a population this size (Andrade, 2021). It would be difficult to generalize that the findings of this project as a part of the entire university. However, it can be possible to have high internal validity if the study is methodically sound and data was properly analyzed (Andrade, 2021).

Lastly, a limitation to this research could be accredited to lurking variables. According to Joiner (1981), lurking variables can be important explanatory variables that affect statistical analysis. These variables are important; however, they are not included among the predictor variables. Variables such as these are often omitted completely from the analysis because their existence is unknown and not proven (Joiner, 1981). In this study, it can be indicative to say that there were lurking variables within the student's participation that existed outside of class. Lurking variables may hide real relationships, while others may create false relationships in the research. Either way, lurking variables have the potential to skew study results in one way or the other. Although these variables may not be identified, they could have affected the interpretation between the relationship of the pre-test and post-test scores (Joiner, 1981).

Implications for Future Research

It can be concluded from the review of literature that with the increasing number of college students reporting escalated levels of stress and anxiety, university campuses need a further solution to meet the needs of all students. Programs utilizing mindfulness are deemed statistically significant and beneficial for these populations. Integrating mindfulness-based interventions (MBIS) appropriately into university curriculum can equip health science students with effective coping skills and resilience needed in their future clinical careers. While it can be inferred that mindfulness is beneficial to this population, there is a gap in the research determining which means of implementation poses the greatest results.

While this project aimed to determine the effects of a body scan mindfulness intervention on mental well-being and resilience, the research regarding what type of intervention works most efficiently is unfinished. With this, future implications for research might include a larger sample size. As mentioned previously, small sample sizes, such as the size used in this project, may undermine the internal and external validity of the research (Faber, 2014). A larger sample size of significance would decrease the inevitable bias and limitations of a smaller sample size.

Secondly, this research would benefit from a more randomized sample, instead of a convenience sample. This is because a randomized sample would allow the researcher to generalize about a specific population and eliminate bias. This type of research could still include students in health science programs, just include a randomized quantitative study design instead. If individuals are selected at random, each participant has some probability of being selected. Finally, randomization has the potential to yield more statistically significant and valid results.

Lastly, in future research regarding this topic, more inferences could be made using a longitudinal study. This intervention spanned over a week, not allowing the long-term effects to be measured. Longitudinal studies have continuous or repeated measures to follow the individuals over prolonged periods of time. In this instance, a semester long intervention with longitudinal observations would have fallen under this category. A longer intervention and observational period may have yielded more positive results using the Five Facet Mindfulness Questionnaire (FFMQ) and the Brief Resilience Scale. In the future, a study of this nature would contribute to pre-existing research in a new way, shedding light on the more long-term effects of the intervention. Findings in this study recommend more mindfulness-based interventions targeted to this subpopulation to improve psychological well-being (Feng, 2019). In all, there is indefinitely more work to be done in terms of successfully integrating mindfulness-based practice into university curriculum in a way that students will benefit in the years to come and allow themselves to carry these skillsets with them in their future clinical careers.

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Appendix A

Full APA Citation	Study Purpose	Design/ Method	Sample/ Setting	Data Analysis	Findings
Burgstahler, (2020).	To identify the effects of guided mindfulness meditation on anxiety and stress in pre-healthcare college students. P	This study used a quantitative approach and examined differences in pre- and post-intervention stress, anxiety, mindfulness, and heart rate variability.	33 students completed 5–12 minutes of meditation 6 days/week for 8 weeks	In Group 1, which had the lowest adherence to the mindfulness practice, there were no significant changes in any of the individual measures. However, in Group 4, with the greatest adherence to mindfulness practice, students experienced significant increases in mindfulness. The results included: (t (7) -3.75, p =0.007) and its subsections of observing (t (7) -	Five to twelve minutes of daily mindfulness meditation is associated with decreased stress and anxiety, and increased mindfulness with greater changes observed following more minutes of meditation.

				<p>4.20, $p = 0.00$), acting with awareness ($t(7) =$ 2.81, $p = 0.026$), and non-judging of inner experience (t (7) = 2.71, $p = 0.030$). Group 4 also experienced significant decreases in perceived stress (t (7) = 4.43, p = 0.003) and state (t (7) = 3.73, $p =$ 0.007) and trait anxiety ($t(7) =$ 4.59, $p = 0.003$).</p>	
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Appendix B

Full APA Citation	Study Purpose	Design/ Method	Sample/ Setting	Data Analysis	Findings
Dawson (2020).	The purpose of the present study was to assess the events of Mindfulness-Based Interventions (MBIs) on university students' mental and physical health	This study conducted a comprehensive systematic review and meta-analysis of randomized controlled trials (RCTs). The researcher searched nine databases, including grey literature and trial registries. Two independent reviewers extracted data following a prospective public protocol.	A systematic search was conducted in five bibliographic databases including: CENTRAL, CINAHL, EMBASE, PsycINFO and MEDLINE. Three grey literature databases were searched including: PROQUEST, and Google Scholar, and	The Mindfulness Awareness Attention Scale (MAAS) and the Five Facet Mindfulness Questionnaire (FFMQ) significantly favored the MBI condition. The results included: (FFMQ: MD = 9.85 [95% CI 5.52, 14.17], $p < .00001$, $I^2 = 76%$, Figure S28;	At post-intervention, depression was significantly reduced among MBI participants compared to the controls. State anxiety was also significantly reduced among participants in MBIs in comparison to passive controls.

			World Health Organization.		
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Appendix C

Full APA Citation	Study Purpose	Design/ Method	Sample/ Setting	Data Analysis	Findings
Rababah (2020).	<p>The purpose of this study was to examine the association between mindfulness and health promotion among undergraduate nursing students. This study aimed to explore the effects on perceived stress, depressive symptoms, self-</p>	<p>This study used a cross-sectional quantitative design. A demographic questionnaire, as well as validated tools were used to measure health promotion, mindfulness, perceived stress, depressive symptoms, impulsivity, and self-care agency.</p>	<p>The population for this study was 195 undergraduate nursing students from a public university in Jordan.</p>	<p>The data analysis revealed that three combinations of the mediators made the mindfulness effect on health promotion statistically significant. This included: perceived stress and self-care agency (effect = -0.01, 95% CI: LL = -0.022, UL</p>	<p>: This study examined the relationship between mindfulness and health promotion in nursing students. The evidence showed that there is a significant impact of mindfulness on nursing students' perceived stress, depressive symptoms, and self-care agency.</p>

	<p>care agency, and impulsivity.</p>			<p>= -0.01); depressive symptoms and self-care agency (effect = 0.016, 95% CI: LL = 0.006, UL = 0.03); and perceived stress with depressive symptoms and self-care agency (effect = 0.006, 95% CI: LL = 0.002, UL = 0.013)</p>	
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Appendix D

Full APA Citation	Study Purpose	Design/ Method	Sample/ Setting	Data Analysis	Findings
Vidic (2019).	This study examined the effects of a seven-week mindfulness-based relaxation course on undergraduate students. This study measured effects on specific factors such as stress, resilience, general self-efficacy, and perfectionism.	This study used a quantitative approach, using two surveys (The Brief Resilience Scale, the Multidimensional Perfectionism Scale, and the Perceived Stress Scale). Participants in the experimental group participated in a mindfulness-based relaxation class that met two times per week over 7 weeks. Participants in the	This study included 71 participants (experimental group: n = 35; control group: n = 36), ages 18-40.	a	This study revealed statistically significant interactions between the effect of the time of the intervention and stress, resilience, and self-efficacy. However, measures of perfectionism did not result in statistically significant findings.

		control group were recruited from other physical education courses.			
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Appendix E

Full APA Citation	Study Purpose	Design/ Method	Sample/ Setting	Data Analysis	Findings
Vilvens (2019).	The present research project explored incorporating mindfulness practices into the higher education classroom. This study aimed to determine how useful the activities might be for managing their personal.	This study consisted of a quantitative data approach using pre- and post-test surveys. The researcher used the Attitude Toward the Subject of Chemistry Inventory; Bauer, (2008), which consisted of 20 opposing words and a 7-point type scale. to questions by rating two opposing words (e.g.,	Thirty-two first-year and sophomore students from a large university participated in a semester-long study, where brief, weekly mindfulness activities were integrated into a personal health course.	The results of the pre- and posttest surveys indicate that only one factor (emotional satisfaction) out of the five factors was significant ($p = .048$). These results revealed that participants felt more comfortable and satisfied with the activities they participated in.	Most students who participated in this study reported reductions in stress and anxiety. Students reported that they would use these practices again in the future to cope with their stress and anxiety. Very few students reported negative outcomes from their practices. One barrier for many students was the lack of time when it came

		worthless 1 or beneficial 7; complicated 1 or simple 7, etc.).			to practicing mindfulness.
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Appendix F

Figure 1: *Five Facet Mindfulness Questionnaire (FFMQ)*

Five Facet Mindfulness Questionnaire (FFMQ)
Ruth A. Baer, Ph.D.
University of Kentucky

Please rate each of the following statements using the scale provided. Write the number in the blank that best describes your own opinion of what is generally true for you.

1	2	3	4	5
never or very rarely true	rarely true	sometimes true	often true	very often or always true

- ____ 1. When I'm walking, I deliberately notice the sensations of my body moving.
- ____ 2. I'm good at finding words to describe my feelings.
- ____ 3. I criticize myself for having irrational or inappropriate emotions.
- ____ 4. I perceive my feelings and emotions without having to react to them.
- ____ 5. When I do things, my mind wanders off and I'm easily distracted.
- ____ 6. When I take a shower or bath, I stay alert to the sensations of water on my body.
- ____ 7. I can easily put my beliefs, opinions, and expectations into words.
- ____ 8. I don't pay attention to what I'm doing because I'm daydreaming, worrying, or otherwise distracted.
- ____ 9. I watch my feelings without getting lost in them.
- ____ 10. I tell myself I shouldn't be feeling the way I'm feeling.
- ____ 11. I notice how foods and drinks affect my thoughts, bodily sensations, and emotions.
- ____ 12. It's hard for me to find the words to describe what I'm thinking.
- ____ 13. I am easily distracted.
- ____ 14. I believe some of my thoughts are abnormal or bad and I shouldn't think that way.
- ____ 15. I pay attention to sensations, such as the wind in my hair or sun on my face.
- ____ 16. I have trouble thinking of the right words to express how I feel about things
- ____ 17. I make judgments about whether my thoughts are good or bad.
- ____ 18. I find it difficult to stay focused on what's happening in the present.
- ____ 19. When I have distressing thoughts or images, I "step back" and am aware of the thought or image without getting taken over by it.
- ____ 20. I pay attention to sounds, such as clocks ticking, birds chirping, or cars passing.
- ____ 21. In difficult situations, I can pause without immediately reacting.

1	2	3	4	5
never or very rarely true	rarely true	sometimes true	often true	very often or always true

- ___ 22. When I have a sensation in my body, it's difficult for me to describe it because I can't find the right words.
- ___ 23. It seems I am "running on automatic" without much awareness of what I'm doing.
- ___ 24. When I have distressing thoughts or images, I feel calm soon after.
- ___ 25. I tell myself that I shouldn't be thinking the way I'm thinking.
- ___ 26. I notice the smells and aromas of things.
- ___ 27. Even when I'm feeling terribly upset, I can find a way to put it into words.
- ___ 28. I rush through activities without being really attentive to them.
- ___ 29. When I have distressing thoughts or images I am able just to notice them without reacting.
- ___ 30. I think some of my emotions are bad or inappropriate and I shouldn't feel them.
- ___ 31. I notice visual elements in art or nature, such as colors, shapes, textures, or patterns of light and shadow.
- ___ 32. My natural tendency is to put my experiences into words.
- ___ 33. When I have distressing thoughts or images, I just notice them and let them go.
- ___ 34. I do jobs or tasks automatically without being aware of what I'm doing.
- ___ 35. When I have distressing thoughts or images, I judge myself as good or bad, depending what the thought/image is about.
- ___ 36. I pay attention to how my emotions affect my thoughts and behavior.
- ___ 37. I can usually describe how I feel at the moment in considerable detail.
- ___ 38. I find myself doing things without paying attention.
- ___ 39. I disapprove of myself when I have irrational ideas.

FFMQ Scoring instructions

For all items marked "R" the scoring must be reversed. Change 1 to 5, 2 to 4, 4 to 2, and 5 to 1 (3 stays unchanged). Then sum the scores for each subscale.

Observing

1, 6, 11, 15, 20, 26, 31, 36

Describing

2, 7, 12R, 16R, 22R, 27, 32, 37

Acting with awareness

5R, 8R, 13R, 18R, 23R, 28R, 34R, 38R

Nonjudging of inner experience


3R, 10R, 14R, 17R, 25R, 30R, 35R, 39R

Nonreactivity to inner experience

4, 9, 19, 21, 24, 29, 33

Appendix G

Figure 2: Brief Resilience Scale

 THE OHIO STATE UNIVERSITY

Brief Resilience Scale (BRS)

Please respond to each item by marking one box per row		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
aaa 1	I tend to bounce back quickly after hard times.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
aaa 2	I have a hard time making it through stressful events.	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
aaa 3	It does not take me long to recover from a stressful event.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
aaa 4	It is hard for me to snap back when something bad happens.	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1
aaa 5	I usually come through difficult times with little trouble.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
aaa 6	I tend to take a long time to get over set-backs in my life.	<input type="checkbox"/> 5	<input type="checkbox"/> 4	<input type="checkbox"/> 3	<input type="checkbox"/> 2	<input type="checkbox"/> 1

Scoring: Add the responses varying from 1-5 for all six items giving a range from 6-30. Divide the total sum by the total number of questions answered.

My score: _____ item average / 6

Smith, B. W., Dalen, J., Wiggins, K., Tooley, E., Christopher, P., & Bernard, J. (2008). The brief resilience scale: assessing the ability to bounce back. *International journal of behavioral medicine, 15*(3), 194-200.