

Exploring the Use of Brief Mindfulness Meditation and Physical Activity to Reduce Stress in College Students

Direct Original Research

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Abstract

Introduction: With the prevalence of stress increasing among college students, stress reduction interventions are essential. This study explored the use of brief mindfulness meditation (BMM) and current physical activity on college students' perceived stress.

Methods: A single-cohort pre-test/posttest design was used to evaluate the effects of an 8-week classroom-based BMM. Current exercise levels and perceived stress, using the Perceived Stress Scale-10 (PSS-10), were measured in a convenience sample of college students (N = 42).

Results: Brief mindfulness meditations were more effective in reducing stress for those who self-identified as "less than moderate" exercisers, $SMD = 3.33$ ($t = 2.801$, $p = .023$) than "moderate," $SMD = -.24$ ($t = -.162$, $p = .873$) or "vigorous" exercisers, $SMD = 2.56$ ($t = 1.577$, $p = .136$).

Discussion: The intervention was more beneficial for those who did not participate in regular physical activity. Thus, BMM sessions held during class served as a helpful means of stress reduction for these students.

Key Words: Mindfulness_meditation; Stress; College students

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Introduction

The prevalence of stress is increasing significantly among college students. In a survey of 67,000 college students from about 100 universities, findings showed that 75% of students indicated that, within the last year, they had experienced at least one stressful event, with 20% of students indicating that they had 6 or more events.¹ The effects of stress within this group can range from mild symptoms to significant depression, even suicidal ideation.¹ For example, 25% of students self-reported being diagnosed or treated for a mental health disorder including depression (13.1%), anxiety (15.8%), and panic attacks (7.4%).¹ Stress reduction strategies for this population are needed.

Mindfulness meditation is recognized as an effective stress reduction strategy. Mindfulness is conveyed through thoughts, emotions, and bodily sensations from a

neutral perspective.² One popular intervention based on Buddhist teachings is known as the MBSR program. Developed by Jon Kabat Zinn, this MBSR program consists of 2 ½ hour group meetings over 8-weeks with an additional one-day retreat. Participants are encouraged to practice mindfulness for approximately 45 minutes daily.³ Researchers have investigated whether MBSR or similar mindfulness strategies can benefit college-aged students. For



example, this program was incorporated into a course taken by 35 undergraduate and graduate students.² The researchers found that MBSR and mindfulness programming were a tool students utilized in a stressful university environment to improve their health and well-being.²

Unfortunately, college students have indicated that lengthy meditations can be an added source of pressure to their already stressful lives.^{2,6} To address this concern, brief mindfulness meditations (BMM) have been developed. These typically involve guided mental imagery either led by face-to-face^{2,7} or using audiovisual technology.⁸ Typically lasting about 5 minutes,⁷ BMM can be offered before or after⁷ class sessions. Brief mindfulness meditations have been shown to reduce stress^{5,7}, anxiety^{4,5,7}, and depression.^{4,5} Findings from these individual studies are consistent with results from other systematic reviews⁴ and meta-analysis.⁹ Additionally, yoga which has mindfulness meditation component, has been shown to be more effective at reducing stress than fitness exercises¹⁰. More research comparing the use of mindfulness meditation in conjunction with other stress reduction strategies is needed. This study explored the use of BMM and current physical activity level on college students' perceived stress. It was hypothesized students who quantified their weekly physical activity as "moderate" or "vigorous" would benefit more from BMM than those reporting "less than moderate". It was speculated that the combination of BMM and physical activity would be more effective at reducing stress compared to BMM with "less than moderate" physical activity.

Scientific Methods

A quantitative, single cohort with pre-test/posttest design was used to evaluate effects of classroom-based BMM in combination with level of current physical activity on perceived stress.

Participants

The convenience sample for this study consisted of health professional undergraduate students enrolled in a required interprofessional education course at a private university in the Midwest. Following approval from the IRB, students were recruited during the first week of classes by the professor of the course who explained the purpose of the study. Subjects provided informed consent to participate in the study.

Protocol

At the end of each class which met twice a week, the professor left and the doctoral student came into the classroom. A doctoral student was selected to lead BMM so that, students would not feel pressured to participate with the professor in the room. The doctoral student played a pre-selected audiovisual recording that was developed by the Honest Guys, who are a team of three individuals from the United Kingdom. The meditations, which last 3 to 5 minutes are freely available on YouTube. Students in the class alternated days of face-to-face with online participation after the first-class period due to the need to social distance during the COVID pandemic. All students had the opportunity to participate in meditation. Of those students who were in the classroom, those who did not participate were asked to sit quietly during the meditation.

To measure stress, the Perceived Stress Scale-10 (PSS-10) was selected because it is a widely used instrument that has demonstrated strong validity and reliability.¹¹ Composed of 10 Likert-type items that measure thoughts and feelings about perceived stress that has occurred during the last month, items on the PSS-10 are rated from 0 to 4 with 0 representing "Never" and 4 representing "Very Often." Responses are summed to calculate a total perceived stress score. To measure physical activity, students self-reported their average physical activity participation over the past 30 days based on the physical activity guidelines established by the American College of Sports Medicine. Physical activity participation was reported as either less than moderate, moderate, or vigorous. This item appeared on the demographic form. Participants completed a demographic form and a baseline assessment using the PSS-10. After 8 weeks, PSS-10 scores were again collected. Paper-pencil surveys were collected by the doctoral student.

Statistical Analysis

Data were analyzed using SPSS by a research assistant. Paired *t* tests were conducted to compare pre-and-post meditation PSS-10 scores. Additionally, PSS-10 scores were analyzed with respect to level of physical activity scores. Statistical significance for all data was established at $p < .05$.

Results

Demographic data were collected (see Table). For all 42 participants, BMM decreased mean PSS-10 scores by a modest 1.59 points ($M = 19.97$ vs., $M = 18.38$; $t = 1.763$, $p = .085$). The intervention did appear to be slightly more effective



for males $SMD = 3.66$ ($t = 1.543$, $p = .183$) than females, $SMD = 1.25$ ($t = 1.275$, $p = .211$). The intervention was most effective for juniors, $SMD = 5.86$ ($t = 2.63$, $p = .039$).

Additionally, 95.2% of students participated in physical activity. Regarding the intensity of physical activity, 9 (21.4%) responded “less than moderate,” 18 (42.9%) responded “moderate,” 15 (35.7%) responded “vigorous.” Students indicated that, on average, they had practiced BMM 9.5 ($SD = 4.5$) times over the 8 weeks. Brief mindfulness meditations were more effective in those who self-identified as “less than moderate” exercisers, $SMD = 3.33$ ($t = 2.801$, $p = .023$) than “moderate,” $SMD = -.24$ ($t = -.162$, $p = .873$) or “vigorous” exercisers, $SMD = 2.56$ ($t = 1.577$, $p = .136$).

Table 1. Demographics (N = 42).

Characteristic	n (%)	x (SD)(Range)
Age		19.4 (.70) (18-21)
Gender		
Male	6 (14.3)	
Female	36 (85.7)	
Race		
Asian/Pacific Islander	5 (11.9)	
Black or African American	1 (2.4)	
Native American or American Indian		
White	33 (78.6)	
Other	3 (7.1)	
Academic Level		
Freshman		
Sophomore	33 (78.2)	
Junior	7 (16.7)	
Senior	2 (4.8)	
Major		
Health care leader	9 (21.4)	
Health sciences	32 (76.2)	
Nursing	1 (2.4)	
Meditation sessions attended		9 (4.5) (3-20)
Physical Activity		
Yes	40 (95.2)	
No	2 (4.8)	
Physical Activity Participation		
Less than Moderate	9 (21.4)	
Moderate	18 (42.9)	
Vigorous	15 (35.7)	
PSS-10 Scores		
Pre-test		19.97
Post-test		18.38

Discussion

The findings from this study are consistent with other studies that have shown that health profession students, such as medical¹² or nursing¹³ students, find mindfulness meditations to be helpful. College-aged students appear to benefit from a combination of BMM and physical activity. Surprisingly, students with lower levels of physical activity showed lower PSS-10 scores following 8 weeks of BMM compared to students who had higher levels of physical activity; thus, the hypothesis was not supported. Because physical activity is known as an effective way to reduce stress levels¹⁴, the addition of BMM may not have made a significant impact on stress levels of physically active students. For those students who lacked moderate or vigorous physical activity, BMM may have provided these students a focused strategy for reducing stress.

There were some notable limitations to the study. Some of those include a small homogeneous sample and a few students who chose to not to participate even though BMM was conducted during class time. Additionally, data regarding whether students in the sample engaged in other meditation practices was not collected. Data regarding



physical activity were collected at the beginning of the study, students may not have continued that level of activity during the study.

Findings may have been impacted from the COVID-19 pandemic because students were experiencing escalated anxieties. Due to social distancing measures for COVID-19, some students were participating through a remote access service which may have affected their engagement during BMM sessions. Furthermore, students who were in the classroom had to wear masks, which could have affected their breathing during meditation.

Conclusion

Incorporating MBSR as a permanent part of the classroom experience is feasible. Using a brief mediation appears to be beneficial for students. Consideration of theories, such as the Health Belief Model¹⁵ or Bandura's Social Learning Theory¹⁶, may help to further explain how BMM and physical activity can benefit individuals in reducing their stress levels. In this study, it was found that brief classroom-based sessions of BMM over 8 weeks led to a modest reduction in PSS-10 scores, which is consistent with findings from previous research. The intervention was more beneficial for those who did not participate in regular physical activity; thus, BMM served as a helpful means of stress reduction for these students.

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