



Effects of a Brief Mindfulness Intervention on Perceived Stress, Affect, and Trait Mindfulness in College Students

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Abstract

The current study was interested in the effects of a quick mindfulness meditation intervention on college students perceived stress, affect, and trait mindfulness. Students were placed into the following three groups: Silent Meditation ($n = 16$), Guided Meditation ($n = 12$), Control (No Meditation; $n = 72$). Each experimental group took part in a four-week mindfulness meditation intervention comprised of one session per week. Students perceived stress, affect, and trait mindfulness were measured pre-intervention, during the intervention, and post-intervention. Perceived stress was measured using the Student Stress Inventory and the College Stress Scale, affect was measured using the Positive and Negative Affect Schedule, and mindfulness was measured using the Kentucky Inventory of Mindfulness Skills. As predicted, students in the silent meditation group reported a statistically significant decrease in perceived stress over the four weeks and an increase in trait mindfulness. Although not statistically significant, the guided meditation also reported a decrease in perceived stress and increase in mindfulness. Results suggest that a short mindfulness intervention may be useful in helping college students deal with stressors of college life.

Keywords: Mindfulness, Meditation, Stress Reduction, Emotional Regulation

Introduction

Attending college can be a stressful experience on many levels. Academic stressors, relationship problems, new environments, and uncertain future goals are only some of the stressors that affect college students' lives on a daily basis [1, 2]. Research indicates college stressors have become more severe [3]. The ability to regulate one's emotions positively is an important skill that promotes positive affect, interpersonal functioning [4], mindfulness [5] and furthermore, may give students the self-discipline needed to be successful in a fast paced and stressful college environment. Maladaptive techniques in regulating emotion may lead to a host of stress related issues including depression, substance abuse, anxiety [1, 4] and symptoms of psychopathology [2]. Accumulating a constellation of these symptoms may result in more severe cases of depression, a lower quality of life, and a poor college experience. The current study will investigate a brief mindfulness-based stress reduction program as an emotion focused coping technique for the stress of college life.

Western society has been adopting concepts and ideas from Asian philosophy and religion for decades. Recently, research on awareness

and meditation techniques has become quite popular. Findings frequently suggest that physical and psychological awareness techniques, like Mindfulness Based Stress Reduction (MBSR) [5] and other meditation styles, may be effective in reducing hostility, symptoms of depression [6], perceived stress [4], and pain [7], while increasing positive affect and trait mindfulness [8]. Practicing meditation continuously has been manifested to make better individual's overall self-respect, self-worth, well-being [9] and self-efficacy [10]. Although mindfulness meditation practices have roots in Buddhist teachings, they are not identified with any religion and may be practiced by people of all religions. Mindfulness is defined as the intentional, non-judgmental, and non-reactive acceptance of one's ongoing thoughts, sensations, emotions, and surroundings [9]. Increased mindfulness may be an important factor in regulating emotions positively and shaping the impact of external stimuli [4, 11].

Mindfulness techniques are being used more frequently as a psychological treatment for disorders such as depression, anxiety, substance abuse, personality disorders, and also for health care employees working in high stress environments [8, 12]. Research has shown the efficacy of mindfulness in treating physiological and psychological conditions and improving individual's overall well-being. Samuelson and colleagues [6] found that mindfulness-based stress reduction programs helped improve self-esteem and mood disturbances, and decreased hostility among inmates in several Massachusetts correctional facilities. Universities including University of Pennsylvania, Duke, University of California, LA; SD, University of Missouri, University of Massachusetts and others across the country have implemented, or are developing, mindfulness-based programs that are accessible to students, faculty, employees, and the community. The University of Pennsylvania has an inspiring mindfulness program focusing on patients who have cancer, and even offers online and over-the-phone treatments for busy and immobile patients.

Commonly, mindfulness interventions are eight-week programs consisting of one session per week lasting approximately two hours [6, 13, 14]. Recent research is suggesting that briefer interventions that last only four weeks or less can also help reduce psychological and physiological stress and anxiety while increasing trait mindfulness [12, 15, 16]. A decrease in stress and an increase in mindfulness were seen after just four weeks of an eight-week meditation intervention [13]. With quick positive results, implementing a brief mindfulness

intervention is a practical investment for schools, health care facilities, businesses, juvenile detention centers, and prisons.

The primary purpose of this study was to conduct a randomized controlled trial to assess the effectiveness of a brief mindfulness intervention in a college group. The main hypotheses in the current study were: 1) students who participated in a mindfulness intervention would report less stress and more mindfulness after the four-week intervention than students in the control group; 2) groups who increased in mindfulness would report a decrease in negative affect; 3) student's stress levels in the control group would increase or last for four weeks. Researchers hope that the results will support prior research on mindfulness, which may be used as support to propose the implementation of a mindfulness program at the university under investigation as well as other sites.

Method

Participants

College students ($n = 100$; Women = 70, Men = 30; M age = 20.53 years; Age Range = 18 – 44; Ethnicity = African American 27, Asian 2, White 63, Hispanic/Latino 2, Other 6; Marital Status = Single 97, Married 1, Separated/ Divorced 2) were recruited from several classes of a medium sized Southeastern U.S. university. The professors of these classes awarded students extra credit or assignment points for participating in the four-week research project. The students were randomly assigned to one of the three following groups: guided meditation group, silent meditation group, or control group. The project required students in each of the meditation groups to attend one mindfulness meditation session a week, for four consecutive weeks. The control group, who did not participate in a mindfulness intervention, was required to meet on the first, second, and fourth week of the research project to fill out surveys. To receive full extra credit points, the students were required to attend all four of the mindfulness meditation sessions, or complete all three survey sessions. All researchers completed ethics training and procedures were followed as defined in the American Psychological Association Code of Ethics [17].

Materials

This study was brought in to play by four independent surveys. The participating members be given each survey three times for the duration of four weeks. Surveys were completed the first week before meditation, the second week after meditation, and the fourth week after meditation. The control group obtained the surveys all along the same weeks as the experimental groups. Jon Kabat-Zinn's guided meditation practice, *The Mindful Way through Depression* [8], was used to narrate the guided meditation group's session. Although researchers in this project are not specifically interested in the meditation's effects on depression, these guided meditations function as a tool to treat a host of other negative emotions, including perceived stress and anxiety.

School Stress Inventory: The School Stress Survey [18] is a 13-question survey that measures if a stressor occurs or not and how severe the experience is for the individual in the context of their school day. The participant must decide whether or not the stressor has occurred during the past two weeks, then marks their answer on a 5-point Likert scale (0 = *has not occurred*, 1 = *not upset*, 2 = *a little upset*, 3 = *mildly upset*, 4 = *very upset*). One question that asked about being sent to the principal's office was removed from the original test because it was not appropriate for a college survey. The survey addresses the following three factors: academic stress, peer stress, and teacher/rules stress. Stress scores are totaled for each individual factor as well as the overall sum of all three factors.

College Student Stress Scale: The College Student Stress Scale [19] is an 11-item measure of perceived stress in college students. Students indicated how frequently they have been distressed, anxious,

or question their ability during the past two weeks. Answers are recorded using a 5-point Likert scale (1 = *never*, 2 = *rarely*, 3 = *sometimes*, 4 = *often*, 5 = *very often*). Items include questions about being away from family, financial anxiety, housing matters, events not going as planned, and handling difficulties. Stress scores are recorded as the total sum of all items.

Kentucky Inventory of Mindfulness Skills (KIMS): The Kentucky Inventory of Mindfulness Skills [20] is a 39-item self-report inventory of the following mindfulness skills: observation, describing, acting with awareness, and acceptance without judgment. Students answers are recorded using a 5-point Likert scale (1 = *never true*, 2 = *rarely true*, 3 = *sometimes true*, 4 = *almost always true*, 5 = *always true*). Each individual mindfulness skill is totaled for an overall sum. Several items are reversed scored.

Positive and Negative Affect Schedule: The Positive and Negative Affect Schedule (PANAS) [21] is a brief measurement of positive and negative affect. The survey is comprised of 20 items including 10 positive affect terms (PA) and 10 negative affect terms (NA). The participants indicated to what extent they feel the given term at the present moment, using a 5-point Likert scale (1 = *very slightly or not at all*, 2 = *a little*, 3 = *moderately*, 4 = *quite a bit*, 5 = *extremely*). Positive item scores are totaled together to give a PA score, and NA scores are totaled to give a Negative Affect score (NA). PA reflects the extent to which a person feels enthusiastic, active, and alert, whereas NA is a general predictor of distress and unpleasurable engagement [21]. A high PA score is indicative of being in a state of high energy, full concentration, and pleasurable engagement. A low PA score may indicate sadness or unpleasant mood. A high NA score is associated with adverse moods such as anger, guilt, fear, hostility and nervousness. A low NA score may indicate a state of calmness and serenity [21].

Guided Meditation Practices-The Mindful Way through Depression: *The Mindful Way through Depression* [8] CD is a series of guided meditations with techniques derived from Asian meditation practices and cognitive therapy research. Tracks on the CD provide instructions on how to sidestep mental habits that lead to despair, self-blame, and rumination. Practicing these techniques help listeners identify when their thoughts and emotions wander off, seemingly uncontrollably, and direct them back, non-judgmentally, to their breath and the current moment. The following four of the seven tracks were utilized in this study: *Mindfulness of the Breath*, *Mindfulness of the Breath and Body*, *Body Scan*, *Mindfulness of Sounds and Thoughts*.

Demographic Survey: The demographic survey was given to collect participants' characteristics, including ethnicity, gender, age, marital status, and meditation participation.

Procedure

Students were randomly assigned to one of the following groups: guided meditation, silent meditation, or control. To complete the intervention and receive all extra credit points, students had to attend one session a week, for four weeks. Each group was given a schedule which offered six meeting times throughout the week. Multiple sessions were offered to give students the maximum opportunity to participate.

Session 1: Upon arrival to the first session, students were asked to sign in on an attendance list. The participants were assured that the attendance sheet would not be connected to data in any way, and would only be used to give credit for participation. After signing in, each student received two copies of an informed consent form. One copy was collected and the other was for participants to keep. Next, a demographic survey was distributed. Following collection of the demographic surveys, a packet including the School Stress Inventory [18], College Student Stress Scale [19], Kentucky Inventory of

Mindfulness Skills [20], and the Positive and Negative Affect Scale [21] were distributed. Students were encouraged not to rush, and to provide honest answers on each survey.

The experimental groups second part of the first session, was a brief 10-and-a-half-minute meditation. The guided meditation group listened to track four of Jon Kabat-Zinn's Guided Meditation Practice [8], titled *Mindfulness of Breath*, while the silent meditation group meditated in silence for an equal amount of time. Before the start of each meditation, participants were given suggestions on how to sit comfortably and a brief introduction to mindfulness meditation. The start and end of the meditations were signaled by the ringing of a bell. After the end of the session bell, participants were encouraged to use the strategies practiced in the meditation at home and were then dismissed.

Session 2: Upon arrival, students were asked to sign-in for participation credit. Session two, of the experimental groups, began with a nine-and-a-half-minute meditation. The guided meditation group listened to track five of Jon Kabat-Zinn's Guided Meditation Practice [8], titled *Mindfulness of the Breath and Body*, while the silent meditation group meditated in silence for the same amount of time. The students were asked to remain seated quietly after the meditation ended while the researcher distributed the second round of surveys. The control group also completed the second round of surveys, but did not participate in any meditation. After surveys were collected, students were encouraged to practice the strategies used in the meditation and were then dismissed.

Session 3-Experimental: Upon arrival, students were asked to sign in for participation credit. Participants in the control group did not have to meet during this week. Students in the experimental groups took part in a 29-minute body scan meditation. The guided meditation group listened to Jon Kabat-Zinn's track two of his Guided Meditation Practices [8], titled *Body Scan*, while the silent group did a similar meditation without the guided narration. For this meditation, students were asked to lay down instead of sitting in a typical meditation pose. After the body scan was complete, students were encouraged to continue using the demonstrated techniques on their own and were then dismissed.

Session 4: Upon arrival to the fourth and final session, students were asked to sign in to record participation. Each meditation group took part in the final meditation of the four-week intervention, followed by a final round of surveys. The guided group listened to track six of the *Guided Meditation Practices for The Mindful Way through Depression* [8], titled *Mindfulness of Sound and Thoughts*, while the silent group participated in a similar meditation without guided narration. After meditation, each group completed the last set of surveys. During the fourth week, the control group also completed the last round of surveys. All groups were debriefed and any questions were answered following the completion of the last set of surveys.

Results

After the conclusion of the four-week intervention, 100 students participated in the study. There were 12 participants in the guided meditation group, 16 participants in the silent meditation group, and 72 participants in the control group. A one-way analysis of variance (ANOVA) was conducted to determine if there were baseline differences in perceived stress, mindfulness, and positive and negative affect between groups. Statistical differences were not found in the baseline tests between groups.

Similarly, one-way ANOVAs were completed for the second- and fourth-week data. No differences between groups were reported in any of the dependent variables during the second week of the mindfulness intervention. During the fourth week of the program, significant differences were found in positive affect $F(2, 97) = 3.88, p = .02$, and mindfulness $F(2, 97) = 3.56, p = .03$. The silent meditation group ($M = 31.12, SD = 9.15$) reported higher positive affect scores than the control group ($M = 24.05, SD = 9.66$, see Figure 1), $p = .02$. In the fourth week, the silent group ($M = 31.12, SD = 9.15$) also scored higher on the KIMS than the control group ($M = 121.12, SD = 15.5$, see Figure 2), $p = .03$. ANOVAs between groups in the fourth week also indicated a moderate difference in negative affect $F(2, 97) = 2.65, p = .07$. The moderate difference was found between the silent ($M = 11.87, SD = 2.09$) and control ($M = 15.43, SD = 6.46$, see Figure 3) groups, $p = .07$. The silent group reported lower scores than the control group in negative affect.

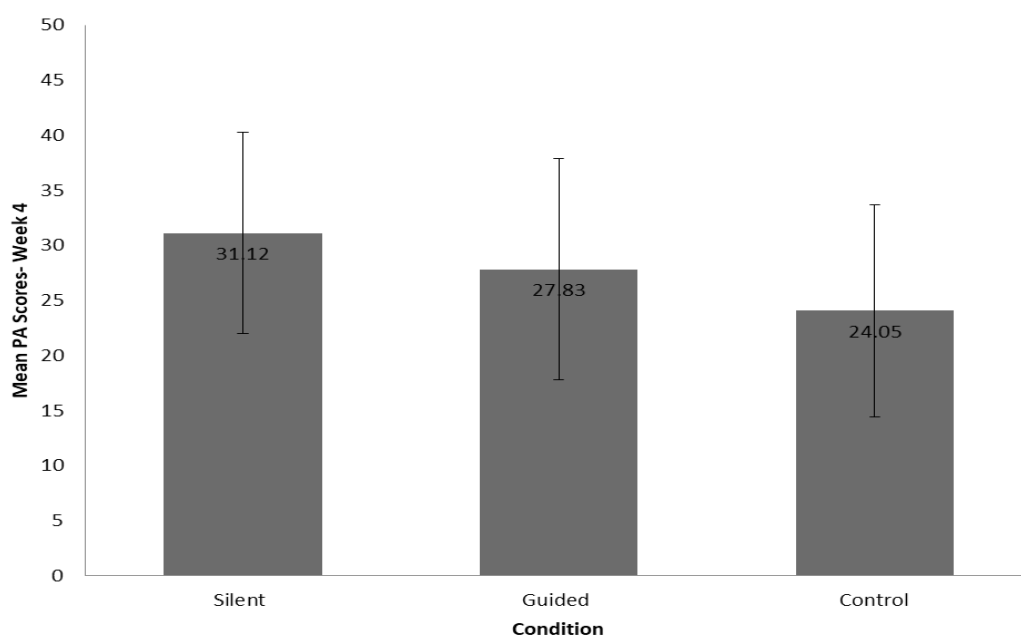


Figure 1. Mean PA scores for week four by condition. Participants in the silent meditation group reported significantly higher PA scores than the control group in week four.

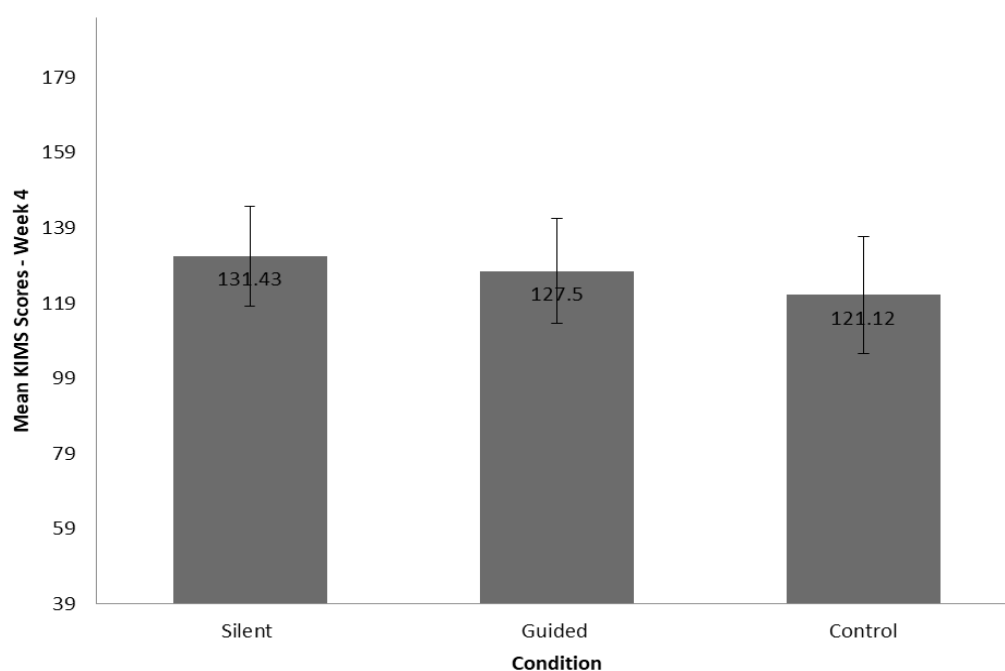


Figure 2. Mean mindfulness scores for week four by condition. The silent meditation group reported significantly higher mindfulness scores than the control group on week four.

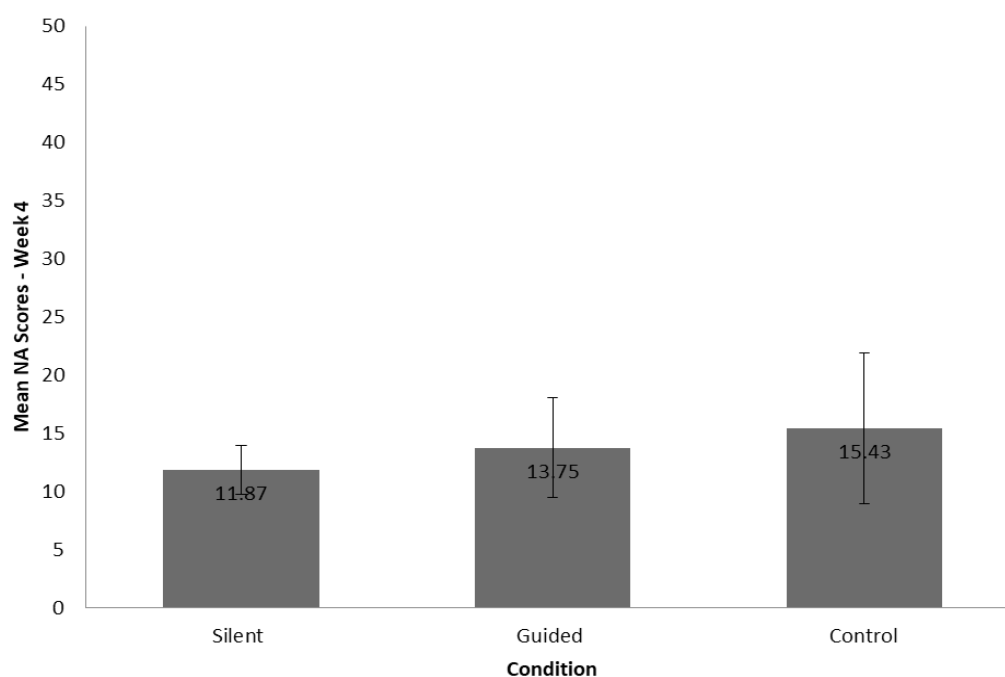


Figure 3. Mean negative affect (NA) scores for week four by condition. The control group scored significantly higher than the silent group in NA on week four.

No differences were found over time (session 1, 2, 3, 4) between groups, but several differences were found over time within groups. Although no significant differences were reported within the guided meditation group, mean scores in several of the domains indicated a possible effect over time. A repeated measures ANOVA reported differences over time in the silent groups' School Stress Inventory, $F(1, 13) = 7.06, p = .01$, College Stress Scale $F(1, 13) = 9.62, p < .001$,

KIMS $F(1, 13) = 9.07, p < .001$, and Negative Affect $F(1, 13) = 11.22, p < .001$. The silent group's mean scores on the School Stress Inventory decreased each week with a significant difference ($p = .05$) between the first week ($M = 15.75, SD = 10.74$) and fourth week ($M = 11.68, SD = 8.12$, see Figure 4) of the mindfulness intervention. Significant differences in the School Stress Inventory subscales were only found in peer stress, $F(1, 13) = 9.40, p < .001$. The silent

meditation groups peer stress decreased each session with significant differences between the first week ($M = 5.06$, $SD = 4.56$) and fourth week ($M = 2.31$, $SD = 1.5$), $p = .02$, and the second ($M = 4.31$, $SD = 3.8$, see Figure 5) and fourth weeks, $p = .04$ of the intervention. The silent group's College Stress Scale mean scores also decreased each testing period with a marginally significant difference ($p = .08$) found between the first ($M = 32.50$, $SD = 8.33$) and second week ($M = 28.26$, $SD = 9.93$, see Figure 6), and a significant difference ($p = .02$) found between the first and fourth week ($M = 26.50$, $SD = 9.12$, see Figure 6). Negative affect scores on the PANAS decreased significantly from the first week ($M = 17.18$, $SD = 7.18$) to the second week ($M = 11.93$, $SD = 2.35$), $p = .02$, and from the first to the fourth week ($M = 11.87$, $SD = 2.09$, see Figure 7), $p = .01$, within the silent meditation

group. Finally, a repeated measures of ANOVA revealed a significant difference ($p = .02$) over time in mindfulness of the silent group between the first week ($M = 125.43$, $SD = 11.19$) and fourth week ($M = 131.43$, $SD = 13.36$, see Figure 8).

Repeated measures ANOVAs identified differences over time in the control group's positive affect, $F(1, 69) = 4.99$, $p = .02$, and negative affect, $F(1, 69) = 12.63$, $p = .001$. Participants in the control group reported a significant increase ($p = .01$) in negative affect between the second week ($M = 13.44$, $SD = 3.90$) and fourth week ($M = 15.43$, $SD = 6.46$, see Figure 9) of the mindfulness intervention. The control group reported a moderate decrease ($p = .08$) in positive affect between the first week ($M = 26.40$, $SD = 8.66$) and the fourth week ($M = 24.05$, $SD = 9.66$, see Figure 9).

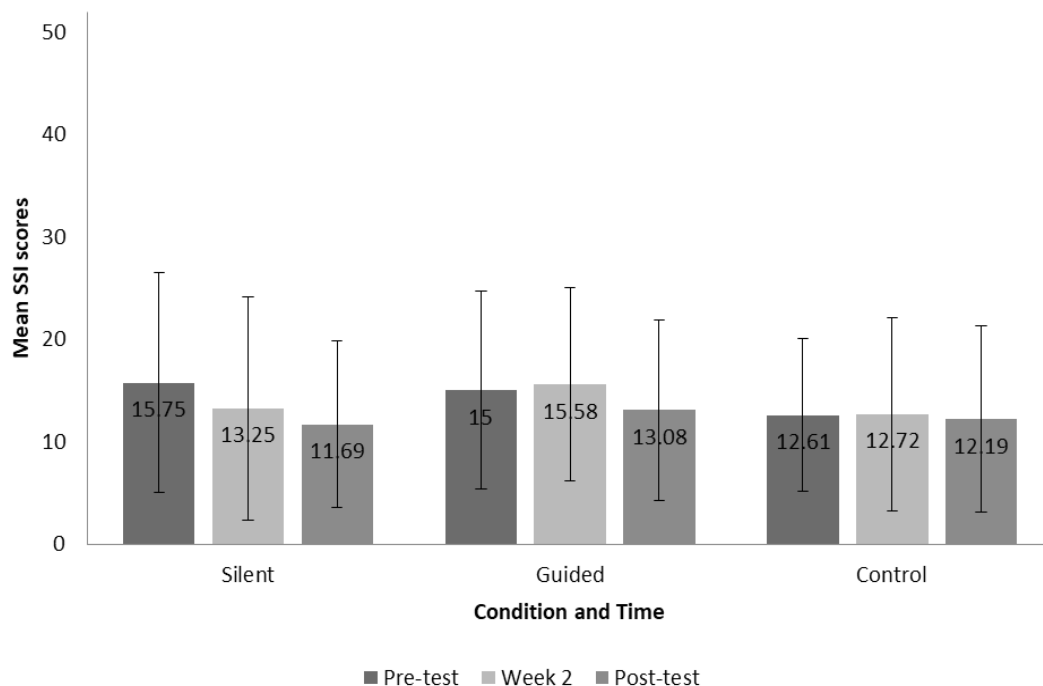


Figure 4. Mean SSI scores over time by condition. The silent group reported a significant decrease in stress between the first and fourth week of the intervention.

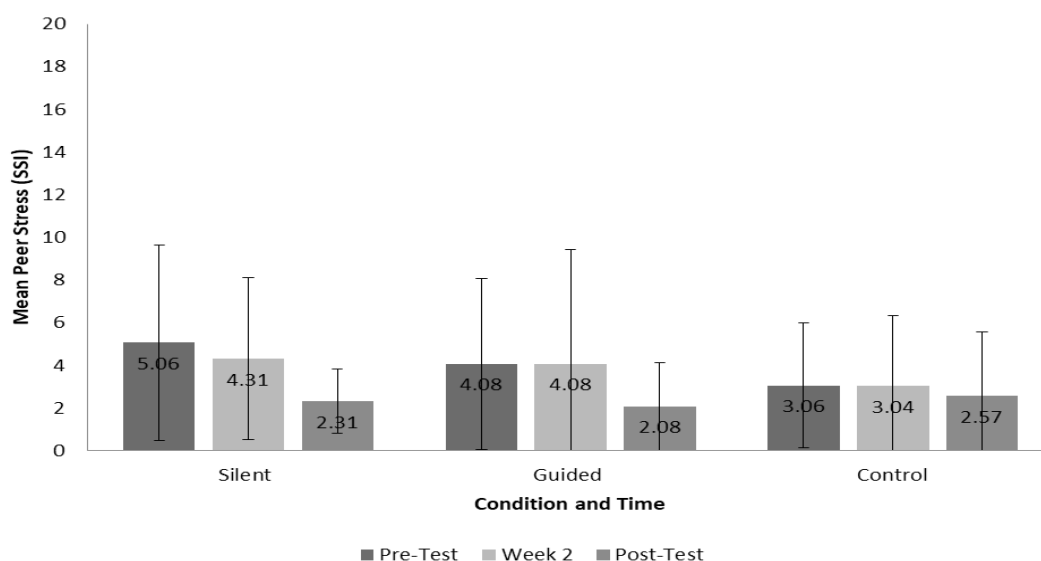


Figure 5. Mean peer stress scores over time by condition. The silent group reported a decrease in peer stress over the four week intervention.

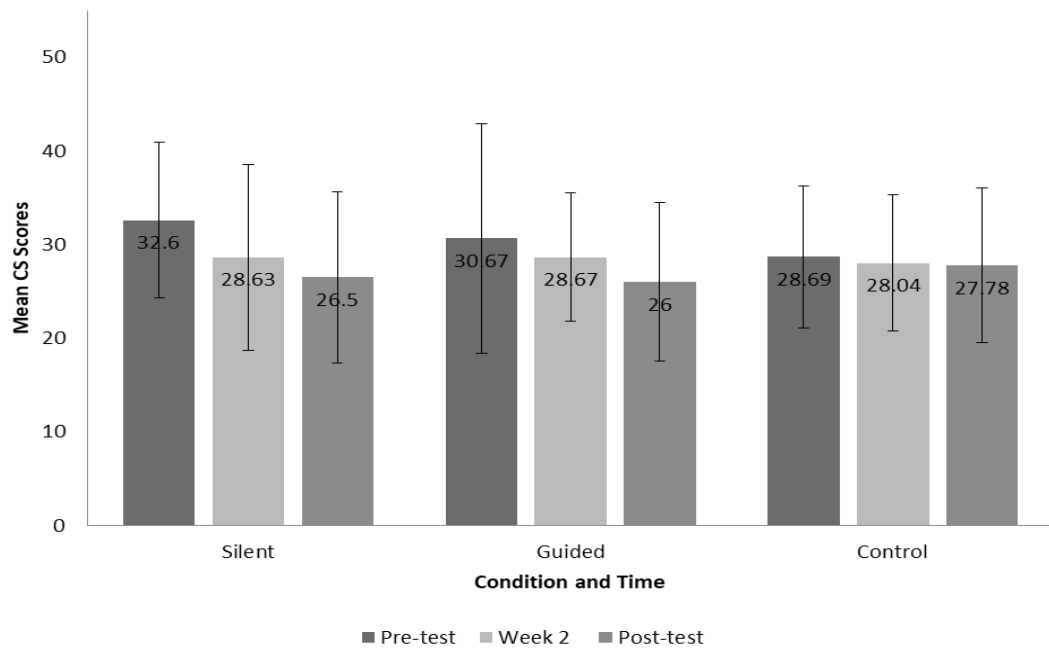


Figure 6. Mean college stress scores over time within groups. The silent group reported a decrease in college stress over the four week intervention.

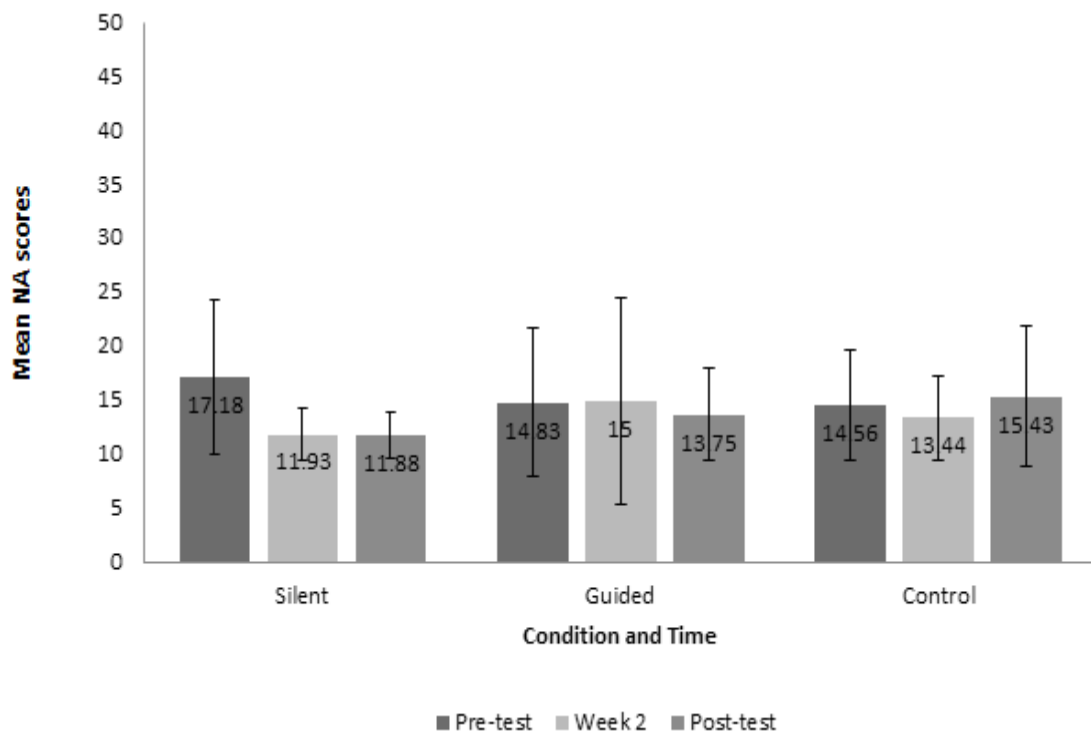


Figure 7. Mean NA scores over time by condition within groups. The silent group reported a decrease in NA between the first and fourth week of the intervention.

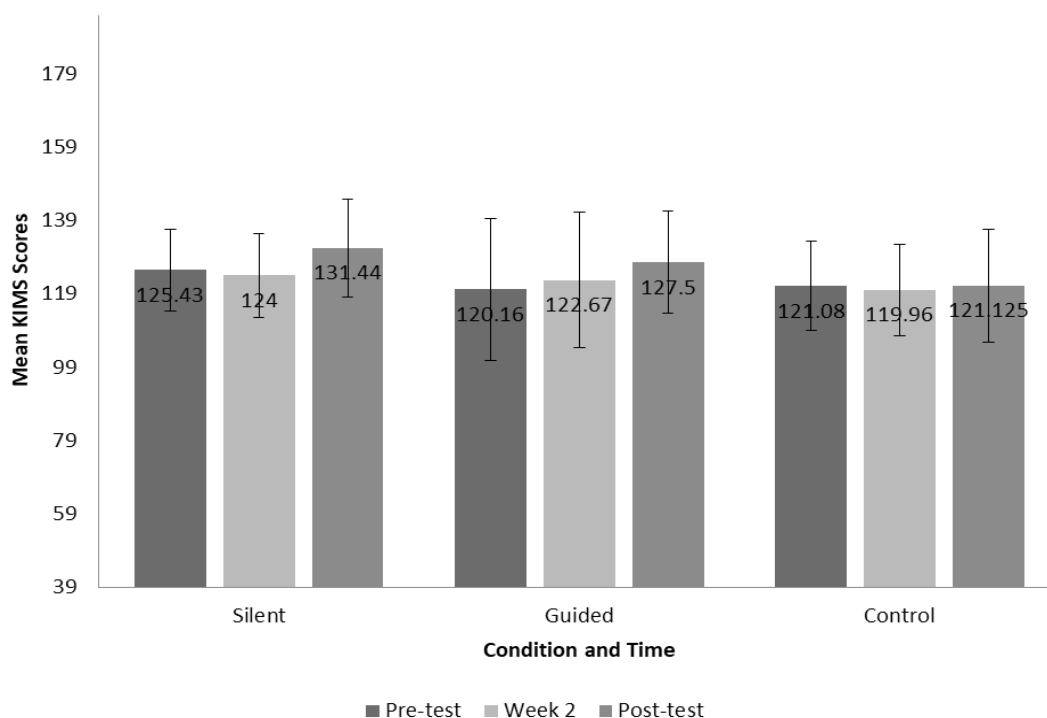


Figure 8. Mean mindfulness scores over time by condition within groups. The silent group reported a significant increase in mindfulness over the four week intervention.

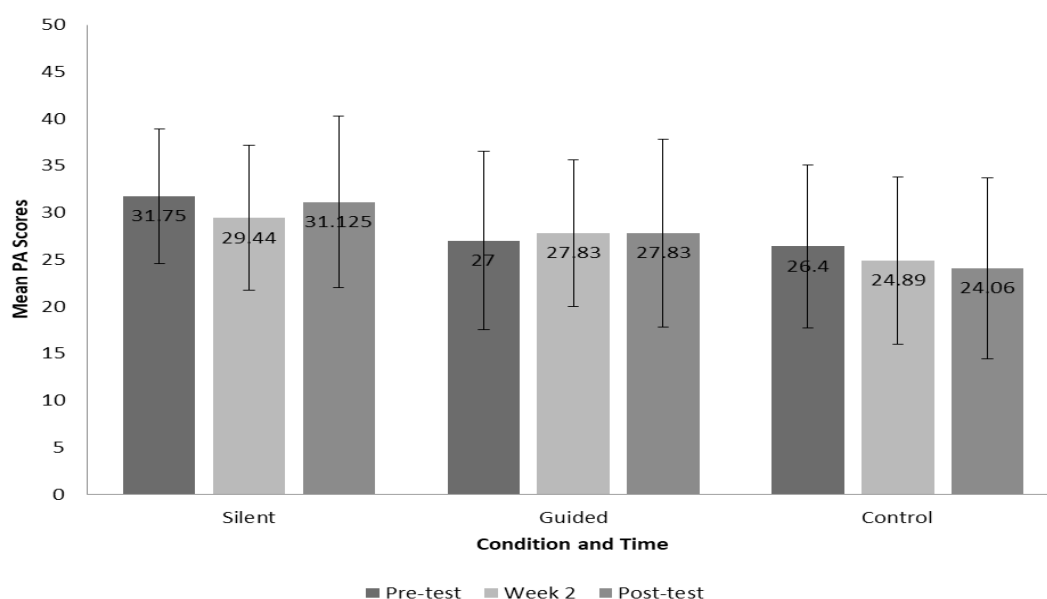


Figure 9. Mean PA scores over times by condition within groups. The control group reported a significant decrease in PA over the four week intervention.

Discussion

The primary purpose of this study was to conduct a randomized controlled trial to assess the effectiveness of a brief mindfulness intervention in a college group setting. The main hypotheses in the current study were: 1) students who participated in a mindfulness intervention would report less stress and more mindfulness after the four-week intervention than students in the control group; 2) groups who increased in mindfulness would report decreased negative

affect; 3) student's stress levels in the control group would increase or remain stable over the four weeks. After analyzing the data, all three hypotheses were supported.

Regarding the first hypothesis and supporting previous research [4, 8, 9, 12], students who participated in the mindfulness interventions reported a decrease in perceived stress and an increase in trait mindfulness. Although statistically significant results were only reported in the silent meditation group, the guided meditation group

reported a steady and nearly parallel decrease in perceived stress and increase in mindfulness. Each meditation group showed a decrease on the peer stress subscale of the School Stress Inventory [18], but again only the silent group's results were statistically significant. Students in the silent meditation group reported a decrease in negative affect while increasing in mindfulness, supporting the second hypothesis. Participants in the guided meditation group also reported a mean decrease in negative affect over the four-week intervention, but the results were not statistically significant. The difference may have been statistically significant if the guided group had more participants. Although the results were not significant, the decrease in mean scores of the guided group suggests that the intervention did have the predicted effect on the participants' negative affect. Finally, the third hypothesis was also supported by statistically significant results of stable perceived stress levels in the four-week intervention.

The results of the control groups stress measures remained stable over the intervention as well as their trait mindfulness scores. Other interesting results were also reported. Over the four-week intervention, members in the control group reported a statistically significant decrease in positive affect and an increase in negative affect. These findings may be a result of students becoming bored or annoyed by filling out the same survey packet multiple times over the four weeks, or they may be experiencing a difficult semester in college.

The hypotheses were directed at within group differences; however, several between group differences were reported. No differences were found over time, but when groups were compared each week of the intervention, several differences were found. During the first week and the fourth week of the intervention, the silent group reported higher PA scores than the control group. The silent meditation group's PA remained stable, but the control group's PA decreased significantly over the course of the intervention, as mentioned previously. Also, during the fourth week, participants in the silent group reported significantly higher scores in trait mindfulness than the control group.

The above-mentioned outcomes are exciting as they align with research that brief mindfulness meditation interventions reduce uncontrolled stress and negative affect [12, 15, 16]. The classic eight-week MBSR programs do not underrate the mentioned outcomes, but suggest brief programs can impact candidates quickly. Also, the outcomes propose that a formal introduction to mindfulness meditation may not be required. To give an instance, most MBSR programs requires an initial introduction to mindfulness meditation before interventions. The outcomes of this study suggest that meditations lasting for 15 to 30 minutes can be effective in relieving stress and increasing personal knowledge. This is important for college students and those who have busy lives that could hopefully benefit from a similar program. Offering short-term, less intense interventions may interest people who are inexperienced meditators or those who are experienced but running short of time to devote to extensive interventions. Researchers in this study believe that a mindfulness meditation class would be a suitable and functional alternative to other active living competence courses. We believe students would benefit from a meditation class similar to Yoga or Martial Arts courses. Offering such a mindfulness class would allow students to simultaneously work towards earning their degree, sharpen their mindfulness skills, and explore new ways of coping with daily stressors. They may increase their ability to regulate their emotions and make better decisions positively influencing their college experience.

The following limitations of the current study are acknowledged: 1) two separate rooms were used during the intervention because of scheduling conflicts; 2) self-reported data allows participants to give

false answers; 3) surveys had high face validity, which could have given away the purpose of the research; 4) the number of members in the tentative groups was relatively low and may not be the best representation of the population as a whole.

Although researchers largely agree that group mindfulness meditation interventions are beneficial [22], research is lacking in the area of individual mindfulness meditation. Future designs should include an individualized meditation intervention as well as group interventions. There may be a benefit to meditating in groups rather than alone for some people, where others may benefit from individual meditation. During the COVID-19 pandemic, a brief mindfulness-based intervention in an online university course was effective in increasing attention, academic self-efficacy, and a sense of belongingness in a college population [23]. Future research should also explore gender differences between groups of meditators and non-meditators. It would be interesting to examine if separating participants into groups that meditate with members of the same sex would have any effect on the way participants report perceived stress and affect. Future designs should also aim to have larger experimental groups. Having a larger experimental group will make the results more generalizable to the sample's population. Adding a gratitude or forgiveness component to the meditation sessions could be a beneficial addition as well. For example, researchers could have participants list several things they are grateful for, or list people who they may want to forgive.

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Competing interests: The authors declare that they have no competing interests.

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