

2021

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Recommended Citation

Evans-Amalu, Kelsey; Beucher, Becky; Jahani, Shiva; and Babayigit, Suat (2021) "Meditation Time in the Classroom: Mindfulness Dosage and Undergraduate Psychological Distress," *Journal of Contemplative Inquiry*. Vol. 8: No. 1, Article 10.

Available at: <https://digscholarship.unco.edu/joci/vol8/iss1/10>

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Meditation Time in the Classroom: Mindfulness Dosage and Undergraduate Psychological Distress

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Objectives: *The present study examined the differences in participants' individual psychological distress over four points in time while they received instructions on a guided mindfulness meditation practice differing in practice time between the two groups (20 minutes or 5 minutes). The study took place in an undergraduate yoga course at a large metropolitan university in the Southeastern United States. Data were collected over the four points in time during one continuous semester using the Outcome Questionnaire-45.2 (OQ-45.2) (Lambert et al., 2004; Tabet et al., 2019).*

Methods: *The purpose of this 15-week quantitative study was to compare the differences in individual psychological distress among 74 students split into two treatment groups. The first treatment group received a 20-minute body scan based on Mindfulness-Based Stress Reduction (MBSR) treatment per session. The second treatment group received a 5-minute body scan treatment per session.*

Results and Conclusion: *Using a repeated measures ANOVA, the researchers examined how mindfulness meditation practice affected psychological distress between the 5-minute and 20-minute sessions. The results showed that as the meditation sessions*

progressed, the interaction of subscales of distress by mindfulness meditation sessions was not statistically significant. However, the results showed there were significant main effects for symptom distress level, $F(1) = 10.34, p = 0.02$; interpersonal relations, $F(1) = 14.61, p < 0.01$; and social role performance, $F(1) = 4.33, p = 0.04$, which decreased significantly. In conclusion, the main effect was statistically significant; the difference in distress is related to whether a person meditated at all. That is, meditate once and you will likely feel reduced distress of some level.

Each year, the American College Health Association collects National College Health Assessment data that describes the state of mental health in college students, and longitudinal research has indicated a statistical increase in psychological distress among students enrolled in higher education (ACHA, 2018; Bayram & Bilgel, 2008; Christian et al., 2015; Eisenberg et al., 2007; Hunt et al., 2017; Storrer et al., 2010).

The rise in mental health concerns amongst college students has led to deeper study of psychological distress management amongst college students through the use of mindfulness-based intervention strategies (Baer, 2003; Long et al., 2021; Travis et al., 2018). Research has shown mindfulness allows students to be more cognitively aware of themselves as individuals and as students, and reduces their levels of stress, depression, and anxiety (Deckro et al., 2002; Shapiro et al., 2008).

One of the more frequent mindfulness interventions used amongst college students is that of Mindfulness-Based Stress Reduction (MBSR), which has shown a positive correlation with a decrease in psychological distress (Jones et al., 2020; Mutch et al., 2020). However, there is a lack of research on the amount of meditation time practiced (dosage), and what amount of time is deemed most effective to decrease psychological distress (Slagter et al., 2011; Strohmaier, 2020). Many studies surrounding Mindfulness-Based Stress Reduction have lengthy programs of intervention (typically 6-8 weeks), high contact hours, and 20-30 minute dosage delivery (Moore et al., 2012). When accounting for instructional delivery time in college (average 1.5-3 hours), a meditation practice with a high dosage rate may not be suitable for class time, as 30 minutes is a high amount of instructional time lost.

The present study tests for a more viable option for meditation time implemented in an academic setting that still holds some benefit to lessening psychological distress. The research evaluates adherence to, and outcomes following, a 15-week (semester-long) guided MBSR-inspired intervention in a university yoga class who participated in either 5 minutes or 20 minutes dependent on the class section under study. Implementation of the intervention occurred every week from the beginning of the semester until the end of the course, in total 15 weeks.

Theoretical Background

Psychological Distress

Psychological distress is a term used to describe negative feelings that impact a person's daily life, and is generally exhibited in the form of sadness, anxiety, distraction, and other symptoms of mental illness (Ridner, 2004). The purpose of this research is to analyze the effects of an MBSR-inspired body scan meditation on college students' psychological distress; variables inclusive of psychological distress include stress, anxiety, and depression, which are subsequently analyzed below.

Mental health amongst college students is becoming worse (ACHA, 2018; Bayram & Bilgel, 2008; Christian et al., 2015; Eisenberg et al., 2007; Hunt et al., 2017, Storrie et al., 2010). With stress stemming from the balance of study, work, and life, college students can experience a wide array of symptoms related to psychological distress (Ryan et al., 2010). Stress levels vary from low to high. However, above-average levels of stress can influence greater mental illness, as seen in college students today (Eisenberg et al., 2007; Stallman, 2010). The levels of both low and high stress may have a negative impact and can influence the academic performance, social well-being, and health of college students (Andrews & Wilding, 2004; Hojat et al., 2003; Kang et al., 2009; Patel et al., 2007; Vaez & Laflamme, 2008).

Similar to stress, there are different levels of anxiety, and stress may be a foundation for anxiety in some instances (Dyson & Renk, 2006; Kamath et al., 2017; Kang et al., 2009). Although students may report experiencing some level of clinical anxiety, other varied types of anxi-

ety include academic anxiety and social anxiety (Przybylski et al., 2013; Scalzo & Martinez, 2017). Some level of anxiety may serve to the benefit of a human being; however, if not addressed, high levels of anxiety may affect student health, academic life, and social life by contributing to overall performance in both brain and body (Beddoe & Murphy, 2004; Chen et al., 2016; Kang et al., 2009).

Depression is the most common mental health disorder in the United States, and is a chronic problem (Barbui & Tansella, 2006). Students diagnosed with depression in college claim to be both academically and socially affected. Not only can depression affect academic performance but it also has the potential to lead to greater substance abuse as an alternative coping tool (National Institute of Mental Health, n.d.).

The researchers chose to use the OQ-45 as an instrument due to the complexities of psychological distress. Although traditionally used as a clinical instrument in therapeutic treatment (Tabet et al., 2019), the scale is uniquely designed to incorporate more depth of understanding in someone's psychological distress—inclusive of intrapsychic symptoms, quality of interpersonal relationships, and occupational and leisure activities (Lambert et al., 2004).

Mindfulness-Based Stress Reduction and the Body Scan

The mindfulness meditation analyzed within this study is inspired by Mindfulness-Based Stress Reduction (MBSR), a westernized form of mindfulness as a contemplative practice developed by Jon-Kabat Zinn in 1979 at the University of Massachusetts Medical School (Flowers, 2014). MBSR has been used among clinical and non-clinical populations (Baer, 2003; Eberth & Sedlmeier, 2013; Goldstein, 2002) and among varied types of populations, inclusive of college students (Bamber & Schneider, 2015; Bamber & Schneider, 2020). The idea of non-judgmental present awareness is foundational to MBSR, aiming at reducing stress and increasing quality of life (Bruce & Davies, 2005). Within MBSR protocol, a variety of mindfulness-based intervention strategies are employed—inclusive of sitting meditation, body scan, and mindful yoga (Sauer-Zavala et al., 2012). Although the MBSR protocol has been studied in its entirety, the varied mindfulness practices contained within MBSR programming

have been studied independently with similar benefit on psychological distress (Sauer-Zavala et al., 2012). For this study, the researchers chose to implement the body scan meditation from Mindfulness-Based Stress Reduction.

The Body Scan (BS) offers participants complete observation of the physical body and awareness of the sensations felt within the body, without critique of present moment experience (Dambrun, 2016; Fischer et al., 2017; Kabat-Zinn & Hanh, 2009). The intention of the body scan is to emphasize awareness to stimulate depth of observation of the relationship between stress and the physical body (Thompson & Gauntlett-Gilbert, 2008). It is important to note there are varied body scan meditations outside of the MBSR program protocol, but a prominent difference in the MBSR body scan meditation is the instruction to pay attention to present-moment sensory experience in the body without trying to change anything. In addition, the MBSR body scan invites awareness rather than solely emphasizing mind-body relaxation (Sevinc et al., 2018). Such practices, like the MBSR body scan, have shown an increase in observation and non-reactivity, as well as improvements in psychological well-being.

Psychological Distress and Mindfulness

Over the past decade, mindfulness has risen in popularity as an intervention tool for psychological distress among college students (Burrows, 2016; Duarte & Pinto-Gouveia, 2015; Koszycki et al., 2016; Schwind et al., 2017; Van Gordon et al., 2014). Varied forms of mindfulness interventions used include trait mindfulness, mindful breathing exercises, loving-kindness meditation, body scan meditation, and mindfulness-based stress reduction with varied measures used to collect data (Burg et al., 2012; Kadziolka et al., 2016; May et al., 2016). Despite the varied measures used, the procedures throughout the studies utilized similar 8-12 week mindfulness programs and similar amounts of dosage (20 minutes as the average) (Burrows, 2016; Duarte & Pinto-Gouveia, 2015; Koszycki et al., 2016; Schwind et al., 2017; Van Gordon et al., 2014). Outcomes were varied, but largely depicted trends of mindfulness meditation as a potential tool for psychological distress.

Psychological distress appearing as depression and anxiety are indicative of an imbalanced nervous system (Gold, 2015). Interoception, a

process of conscious and unconscious awareness of one's internal states of being, corresponds with achieving healthy levels of homeostasis in the body (Bonaz et al., 2021). People suffering from psychological distress in the form of depression and anxiety can theoretically regulate the parasympathetic and sympathetic nervous system through working to create balance in the autonomic nervous system. This balance is specifically achieved through vagal nerve stimulation via breathing and yogic practices which stimulate parasympathetic response to have a settling effect on the body (Gerritse & Band, 2018).

Mindfulness Meditation and Practice Time

As previously detailed, mindfulness-based interventions may be beneficial for mental issues (Burrows, 2016; Duarte & Pinto-Gouveia, 2015; Koszycki et al., 2016; Schwind et al., 2017; Van Gordon et al., 2014). Yet there is little evidence and research into the amount of prescribed mindfulness practice time (Berghoff et al., 2017). According to Ribeiro et al. (2018), there has been research on the amount of time and the frequency participants practiced mindfulness meditation, but little statistical evidence on whether there are any correlations between time and the outcomes of the intervention. Recent studies outlined below examined the amount of time practiced and outcomes to understand if there was correlational evidence that outcomes could be predicted by time.

In a study conducted by Ribeiro et al. (2018), the researchers attempted to understand the relationship between adherence to a meditation protocol and any statistical outcomes, looking specifically at the length, frequency, and type of practice chosen by a sample of 55 elderly participants (50-80 years of age) over a total of 14 weeks. The end results suggested there were improvements in stress and quality of life, yet there was no correlation exhibited with practice time. Within the study participants chose their meditation and were allowed to practice at home. The small sample size does not lend itself to generalization; however, a recent study conducted in 2017 evokes more similarity to the researchers' current study.

A study conducted by Berghoff et al. (2017) evaluated the relationships among adherence to a meditation practice, the amount of time

practiced, and mental health. The study examined meditation as an intervention tool over a two-week period. Differences were examined amongst two groups, with one group receiving a 10-minute meditation practice while the other group received a 20-minute meditation. The sample size was relatively small with 77 participants involved. The results of the study revealed no significant difference between the two groups in relation to time and amount practiced. There was also a reduction in stress evidenced within each group.

The most recent peer-reviewed research by Strohmaier (2020) detailed an understanding of dosage and psychological distress. The study included a cross-sectional review of previously conducted studies to examine dosage of Mindfulness-Based Programs (MBP). Upon review of the literature via a meta-regression, MBPs appeared to be helpful with psychological distress. Results also showed that larger and smaller dosages of mindfulness showed no difference upon participant psychological distress, and what appeared to matter more was more mindfulness sessions .

In the present study, the researchers used the following studies to guide the research questions. However, the Berghoff study was predominantly used as a foundation due to its specific examination of time practiced in mindfulness meditation among two groups.

The research question for the present study include:

RQ: To what extent, if any, does mindfulness dosage affect psychological distress?

Ho: There is no difference in time with mindfulness practice.

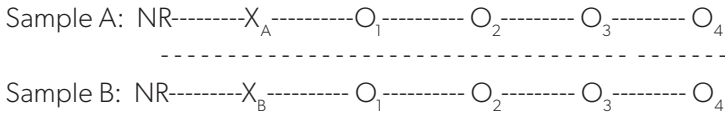
Ha: There is a difference in time with mindfulness practice.

Methodology

Data was analyzed to address the time difference of mindfulness meditation and the outcome on psychological distress among university students. Data was collected through the administration of an online survey given at four different times over the course of a semester.

Design of the Study

The purposive study employed a survey research design.



As the design indicates, participants were not randomly assigned to groups (NR). Therefore, attention was given to selection bias as a potential threat to internal validity. In the figure, X_A represents participants in the mindfulness meditation or experimental group who received a longer time amount in mindfulness meditation treatment. X_B represents participants in the mindfulness meditation group who received a shorter guided mindfulness meditation practice as their treatment. The tests signified between O₁ and O₄ represent the surveys taken across four time points.

Participants

The study took place at a large metropolitan university in the southeastern United States with 74 participants, 36 in the 5-minute body scan group and 38 in the 20-minute body scan group. The participants were all enrolled in one of two sections of an undergraduate yoga class for college credit. The undergraduate yoga class was constructed with the same syllabus and expectations between each group under study. The population of students was inclusive of varied programs throughout the university, with students from the science and education programs making up a large section of the population under study.

A purposive sample was used to capture participants' self-reporting of their psychological distress. Of the initial 160 undergraduate students who participated in the yoga class and research, 153 students received the email survey. Out of 153 participants, 74 students completed the first survey. The survey was sent to participants within the class four times over the course of a semester. Survey respondents dropped over time, with 68 students completing the second survey; the third, 65; and the fourth, 62.

Instrumentation

The survey, OQ-45.2, was created using an online survey distribution program, *Qualtrics*, and has been previously used in examining “levels of psychiatric symptoms, performance in various roles and activities, interpersonal functioning, and levels of life satisfaction or quality of life” (Beckstead et al., 2003; Lambert et al., 2001; Lambert et al., 2002, Lambie et al., 2019). The OQ-45 (Lambert et al., 2004) is a 45 item self-report instrument designed to assess participants’ therapeutic progress by measuring their perceived psychological disruption.

The OQ-45.2 provides a total score and three subscale scores within the survey. The three subscales include the analysis of a participant’s social role, symptom distress, and interpersonal relations. Nine of the items measure the presence of positive mental states evenly divided across the three subscales. In this study, the total score and the subscores were analyzed over time to estimate clinical significance (Tabet et al., 2019).

A 5-point Likert scale is used to rate the 36 items related to psychological distress, ranging from 0 (never) to 4 (almost always), with higher scores reflecting greater distress scores within three subscale domains (a) symptom distress (SD) (e.g., “I feel no interest in things”), (b) interpersonal relations (IR) (e.g., “I get along well with others”), and (c) social role (SR) (e.g., “I feel that I am not doing well at work or school”). The remaining nine items in the OQ-45 response set which measure positive mental states are reverse scored as 4 (never), 3 (rarely), 2 (sometimes), 1 (frequently), and 0 (almost always). The total OQ-45 scores are calculated by summing all 45 item ratings with a range from 0 to 180.

Each of the participants was assigned a numeric code to ensure confidentiality of responses. One researcher participating in this study sent an email with a link to the participants and requested completion of the survey electronically once a month throughout the semester, totaling four time points.

Procedures

Prior to carrying out data collection, the university Institutional Review Board approved all procedures for the current study. The study was con-

ducted at a local university examining 74 undergraduate students who were enrolled in an undergraduate yoga class. The two undergraduate yoga classes represented two sections of the same course available to any student at the university, with no prerequisites necessary prior to starting the course. The two sections comprised a diverse group of students with similar numbers enrolled in each section. All were undergraduates and ranged from freshman to senior students. There was a variance in times when the class sections met, as the shortened mindfulness meditation (5-minute) intervention occurred during the Tuesday/Thursday section of the course for a 1.5-hour class section, and the 20-minute mindfulness meditation intervention was implemented during the three-hour section of the Thursday night class.

In each section, students met regularly each week to learn the physical practice and historical background of yoga, inclusive of yoga asana. Upon the start of the course, students were informed of what the study would entail and given the choice to participate. Once given the option of participation, surveys were sent out to establish a baseline prior to the implementation of the body scan meditation. After baseline, the mindfulness facilitator/instructor would implement the body scan at the end of class, either for five minutes or 20 minutes, dependent on the class section under study. Implementation of the intervention occurred once per week from the beginning of the semester until the end of the course (15 weeks). In total, the intervention was implemented 15 times per section.

Regardless of section, the outline of the class remained the same. In detail, students received direct instruction about the history and philosophy of yoga, then entered into the performance of the postures. The instruction was largely based on athletic performance rather than contemplative practice. Upon the conclusion of the dynamic stretching practice, the instructor allotted time at the end for a guided body scan practice. For this study, the researchers used a version of the Body Scan Meditation commonly associated with MBSR. The facilitators of the intervention were not trained in MBSR; thus, the version used was not under the guise of Jon Kabat-Zinn's methodology for the 8-week MBSR protocol. However, the instructors' script was highly influenced by MBSR. The 5-minute mindfulness meditation relied little on the instructor for guidance, yet

encouraged the students to continue to observe their body and breath over the 5-minute exercise. The extended mindfulness meditation experimental group was led by a co-teacher in an extended body scan meditation, which lasted a total of 20 minutes after the dynamic stretching portion of class each Thursday when the class met. The extended body scan meditation added more detail and longer pauses between guidance of scanning body parts head to toe mindfully and with full awareness. Upon delivery of the meditation practice, students were dismissed from class.

Results

The demographics of the OQ-45.2 survey data were summarized with the following features: Interpersonal Relations, Social Role Performance, Symptom Distress, and Overall (see Table 1). We first determined the means and standard deviations of each of these characteristics over time to begin the analysis. The statistics showed that all participants' stress levels decreased over sessions of the mindfulness meditation interventions.

Table 1. Univariate Statistics for variables in analysis

		Means/SD			
Subscales	Session	T1	T2	T3	T4
Interpersonal Relations	5min	11.9/8.3	9.5/5.8	9.8/6.2	9.1/5.5
	20min	11.4/5.1	10.4/5	9.5/4.6	8.5/5.6
Social Role Performance	5min	9.5/6.8	8.5/6.2	8.4/5	8.1/5.2
	20min	9.4/4	10.6/5.5	9.5/4.2	8.5/4.1
Symptom Distress	5min	22.5/13.9	20.5/13.1	20.6/13.1	20.2/14.2
	20min	20.4/8.9	20.7/10.5	20.6/9.8	18.7/9.5
Overall Stress Level	5min	43.9/13.6	38.5/23.2	38.8/23.1	37.3/23.4
	20min	41.3/13.6	41.6/17.8	39.7/15.5	35.7/16.1

Though the statistics made some patterns clear, they did not paint a definitive picture of the mindfulness meditation groups (5 min. vs. 20 min.). A 2x4 factorial ANOVA was used to examine the intersection of these subscales, which would help determine how mindfulness meditation practice affected psychological distress between the 5-minute and 20-minute sessions. The information shows that as the meditation sessions progressed, the interaction of subscales of distress by mindfulness meditation sessions was not statistically significant, but there were significant main effects for symptom distress level, $F(1) = 10.34, p = 0.02$ (see Figure 1); interpersonal relations, $F(1) = 14.61, p < 0.01$ (see Figure 2); and social role performance, $F(1) = 4.33, p = 0.04$ (see Figure 3), which decreased significantly.

Figure 1. Symptom Distress

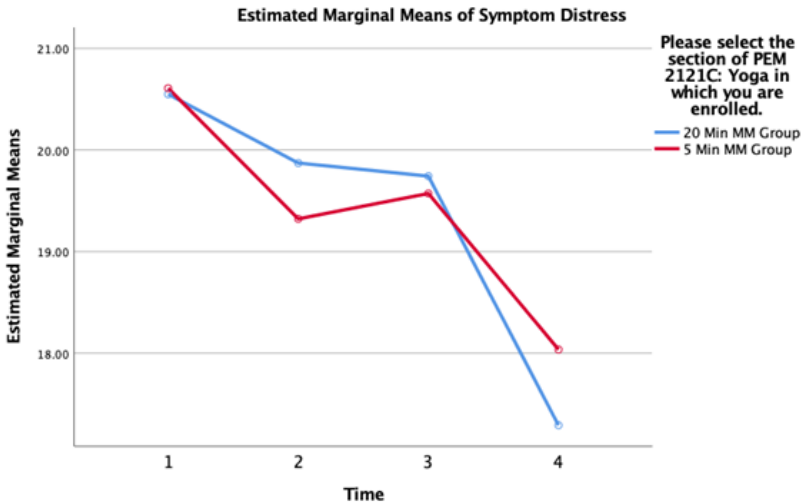


Figure 2. Interpersonal Relations

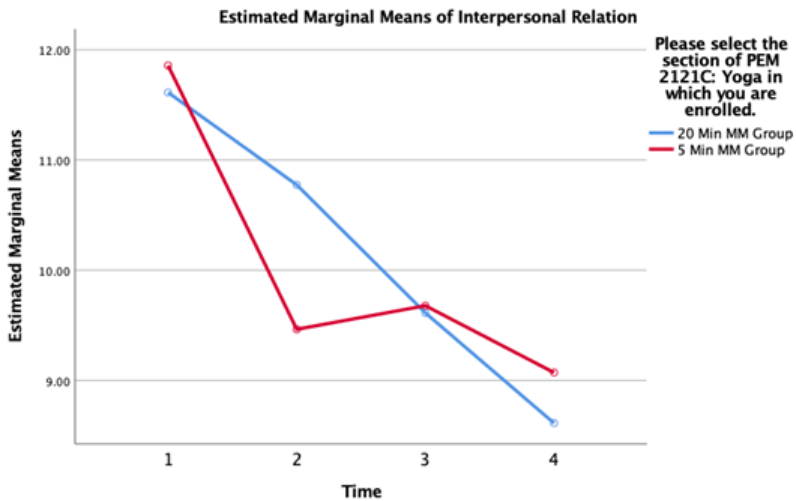


Figure 3. Social Role Performance

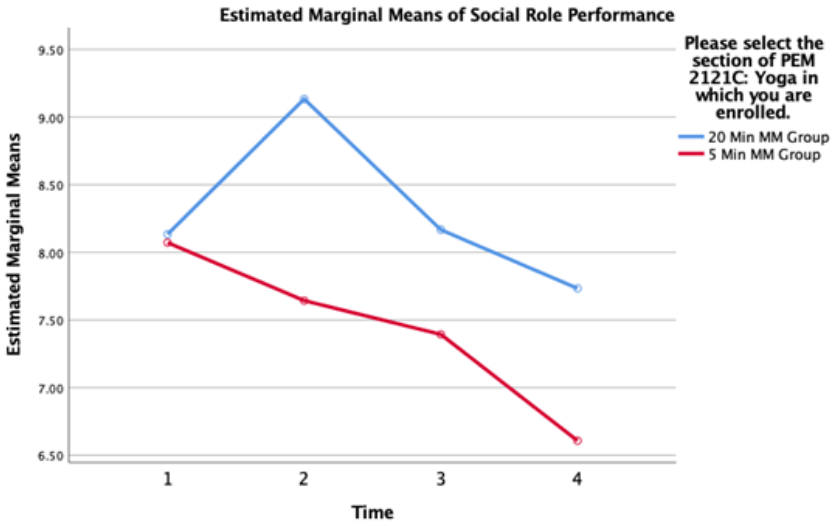
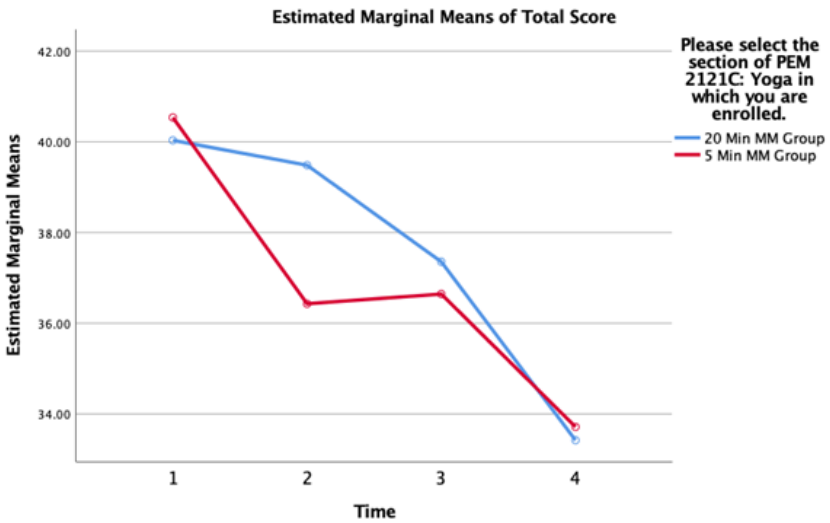


Figure 4. Total Score



Discussion

The present study evaluated the effect of prescribed mindfulness exercise length (5 minute versus 20 minute body scan) over the span of a semester in a university yoga class. Implementation of the intervention occurred every week from the beginning of the semester until the end of the course—in total, 15 weeks. The researchers hypothesized practice time would predict improvements in psychological distress but would differ upon the variable of time practiced.

To fully address the research question, several tests were run to understand any interactions between the intervention and psychological distress. Recent evidence indicates time spent in daily mindfulness is associated with reduced rates of psychological distress, which suggests increasing adherence to a mindfulness practice may improve outcomes upon treatment (Crane et al., 2014). The results of this research parallel the literature, as seen in Table 1, which demonstrates that total stress score slightly decreased over four sessions of the mindfulness intervention.

Upon examining the mean scores, a repeated measures ANOVA was conducted. The main effect was tested using repeated measures ANOVA and the total distress score showed a statistically significant difference over time in mindfulness practice type, $F(2.44, 141.30) = 5.80$, $p < 0.05$. The output suggests the groups did differ in psychological distress, which may suggest a longer mindfulness exercise does reduce symptoms of psychological distress symptoms, as suggested by Ribiero et al.'s (2018) study and supporting the researchers' hypothesis.

Students were not randomly assigned to treatment groups; assignment was based on their availability and attendance in class, so it is difficult to untangle confounding variables. Researchers tested to see a difference in students' three subscores and total distress score at Time 1 between 5-minute meditation and 20-minute meditation groups. As a result, there is no difference in the distress scores between the two groups at Time 1. Therefore, the results can be generalized for the population, with no issues in external validity.

Though the exercise lengths evaluated as part of this study were shorter than those often assigned as part of MBIs (i.e., 45 minutes), longer mindfulness exercises (e.g., 30–45 minutes) may have presented

a significant challenge in implementation and potentially introduced a barrier to adherence due to the limitations of available class time for students and instructors. However, the results are supported by current research in that a shortened dosage of mindfulness may still contribute to lower rates of psychological distress (Berghoff, 2017; Goyal et al., 2014; Strohmaier, 2020).

It is important to note that the 20-minute mindfulness practice did show slight improvements in comparison to the 5-minute practice. Yet the differences are only slight, and the 5-minute mindfulness exercise still showed slight improvements to psychological distress. This is important to note for mindfulness exercises in classroom settings, as teachers/instructors who guide the mindfulness practice may not always have a large amount of time to implement a mindfulness protocol. The present study suggests mindfulness exercises may not require long periods of practice before realizing any benefit. By spending even five minutes a day, a student can potentially obtain relief from psychological distress. If the instructor has more time available, a longer mindfulness practice may be offered for potentially greater benefit.

As reviewed by Strohmaier (2020) and reflected in the present study, mindfulness dosage and longer contact hours over time may be something teachers wish to consider when implementing a Mindfulness Based Program. More research needs to be done to see if contact hours and dosage play a part in impacting psychological distress, especially considering the current research implemented a mindfulness protocol over the span of a semester, which tends to be longer than average MBSR programs (6-8 weeks).

Limitations

The sample was limited to a single university and one state within the United States. Thus, the sample is not representative of diverse locations and limits the generalizability of results across sub-populations. In addition, the sample did not distinguish between various factors that might potentially give a clearer picture of who was surveyed (e.g., gender, employment status and hours of work per week, including past experience with

yoga and/or mindfulness meditation). Nevertheless, the sample may be representative of a diverse population as the participants are enrolled at a large, multicultural university.

An additional limitation of the study included the study design, as the participants were attending university yoga classes of different lengths. The amount and intensity of physical activity performed during the classes differed and may have influenced the students' response to the body scan.

Conclusion

The results showed the impact of time upon novice practitioners of mindfulness and the decrease of college students' psychological distress over the course of one semester. Total time spent in the mindfulness practice over the course of a semester, as assessed with the OQ-45.2, showed slight differences between the groups assessed. A significant pre-post decrease was found for both experimental groups, suggesting that sustaining the practice of brief mindfulness exercises over time confers positive benefits (Khoury et al., 2013). The result built upon the previous literature (Berghoff, 2017) and confirmed time may be a variable of change with the effects of a shortened body scan practice.

Future research should investigate the variable of time as a potential moderator between mindfulness and psychological distress in college students. The researchers desire to replicate the same study design using a different survey instrument and biomarker research data. More quantitative studies are needed to confirm the results outlined in the research.

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