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Experiences With Mindfulness

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Abstract

Despite being practiced for centuries, the topic of mindfulness has only recently been subjected to serious study, with most research being done in the past few decades. Mindfulness, which is characterized by acknowledging thoughts and feelings without judgement, has begun to be included in clinical applications, called Mindfulness-based Interventions (MBIs). Research has shown the positive impacts that MBIs can have, especially in matters of mental health. However, there is much less research on how to best implement these interventions, such as how MBIs can be adapted in response to patient feedback. In a clinical setting, patients respond better to treatment when they feel that their practitioners are responsive to them and their needs. In this study, I explore how offering modifications in response to feedback during a mindfulness intervention impacts the effectiveness of and satisfaction and engagement with a mindfulness intervention.

1. Introduction

1.1 Mindfulness-Based Interventions

The practice of mindfulness has been increasing in popularity, gaining the attention of yoga instructors and clinical researchers alike. Mindfulness can be defined as a focused and non-judgemental awareness of the present moment, not feeling attached to any thoughts and feelings and letting them pass as they come up (Zou, 2016). With strong roots in hinduism and buddhism, mindful practices have existed for thousands of years as tools for deep introspection and clarifying calmness (Dimidjian 2003). Over the past few decades, researchers have begun to explore the use of mindfulness in both mental and physical health interventions.

There are many Mindfulness-based Interventions (MBIs), but two of the most well-established MBIs are Mindfulness-Based Stress Reduction (MBSR) and Mindfulness-Based Cognitive Therapy (MBCT). MBSR contains activities such as meditation and yoga along with other treatment methods as an approach to stress reduction that improves well-being (Zou 2016). MBCT is similar to other forms of cognitive therapy, where some goals include the identification of one's mental state and the use of coping tools, however MBCT focuses on the acceptance of self and an ability to work *with* the mind rather than changing or "fixing" it (Zou 2016). Both of these MBIs have proven to be effective in their respective applications, and more MBIs are developing that promise to be another useful tool for treating things such as chronic pain and addiction, as well as regulating ASD and PTSD (Zhang 2021). As promising as MBIs may be, it is important to recognize that there is no such thing as a 100% effective intervention for any population, as with any other kind of clinical intervention. Exercises that calm most people may have the opposite effect in certain circumstances. For example, an exercise that focuses one's attention on what they see and hear may be stressful or even triggering for those with visual/auditory impairments or hallucinations. This is why for MBIs, or any clinical intervention, it is necessary to consider who is receiving the treatment and how they are doing so (Dimidjian 2015).

1.2 Implementation of Clinical Interventions

As MBIs increase in popularity, it is crucial to develop a thorough understanding of how to best implement these interventions. A major component for how well a patient responds to interventions is the extent to which care providers respond to their patient's input and feedback (Stivers 2023). This is best reflected in the person-centered model of care. In a person-centered model, the patient works with their care provider to create a comprehensive treatment plan, balancing their needs, preferences, and goals with the provider's resources and abilities to make a plan that works for everyone involved (Sussex 2022). Process is actively monitored, with goals and methods being revisited regularly so they can adapt to the patient's progress (Sussex 2022).

It is also important to consider the context of an MBI within a patient's life. The practices of mindfulness can be expanded into a whole way of life, as is what is practiced by some Buddhists or Hindus. Patients who are more actively engaged with their intervention are likely to get deeper results out of it (Dimidjian 2003). Considering the relationship between a patient and their care provider(s), one that is open and responsive to the patient's input and feedback, as well as invested in patient outcomes, may lead to improved outcomes in a MBI.

This study aims to expand on previous research done on the effectiveness of self-directed mindfulness interventions, but additionally considering the dynamic between participants and the primary investigator. There are three primary research questions: 1) How does providing modifications to a MBI in response to feedback impact the effectiveness of the mindfulness intervention? 2) How do provided modifications to a MBI in response to feedback impact participants' satisfaction with their mindfulness intervention? 3) How do provided modifications to a MBI in response to feedback impact participants' engagement with their mindfulness intervention?

2. Methods

2.1 Participants

Participants were recruited from UNCA campus via posted flyers and classroom visits. The recruitment flyers displayed a QR code that led to an interest form that asked potential participants to submit their name and UNCA email address. Those who struggle with anxiety, panic attacks, or breathing issues were advised to not participate in the study. Interested participants would receive an email containing a unique identifier code, an intake form and a link to a website to schedule an initial meeting. A total of 34 individuals contacted the student PI with interest in participating in the study.

2.2 Materials

2.2.1 Demographics

Demographic information was collected from participants as part of the intake form. Participants were asked questions about their age, gender, race/ethnicity, income, and religious/spiritual beliefs.

2.2.2 Kentucky Inventory of Mindfulness Skills (KIMS)

To measure qualities of mindfulness experienced by participants and how it changes due to participation in the study, the Kentucky Inventory of Mindfulness Skills (KIMS) was administered as part of the intake form and conclusion of study form. The KIMS is a 39-item questionnaire where each statement is ranked on a five-point scale from “Never or very rarely true” to “Always or very often true” (Baer, 2004). KIMS measures four skills closely associated with mindfulness: observing (noticing external and internal stimuli), describing (labeling thoughts or sensations as they occur), acting with awareness (engaging fully in one’s current activity with undivided attention), and accepting without judgment (not evaluating experiences in the present moment and letting them be as they are).

2.2.3 Weekly Check-In

To measure each participant’s experience and engagement with the mindfulness intervention over the course of the study, a check-in form was sent weekly. To obtain a weekly completion rate, the check-in form asked participants to report the number of days they were able to complete the exercise that week. Participants would report their satisfaction with the exercise on a 7-point scale from very frustrated to very satisfied, and two additional 5-point scales for how often the participant is satisfied or frustrated. Additionally, there are prompts for the participant to share how they felt during and after the exercise.

2.2.4 Focused Breathing Exercise

The mindfulness intervention used in this study was the focused breathing exercise, adapted from a breathing exercise used in MBSR (Kabat-Zinn 1990). This self-directed exercise involves focusing on the sensations of breathing while being aware of any passing thoughts. If attention begins to wander, it must peacefully be brought back, returning focus to the breath and letting any other thoughts pass without judgement. This exercise practices two core elements of mindfulness: awareness and non-judgemental acceptance (Eisenbeck 2018). Participants were asked to perform this exercise for 10 minutes each day throughout the five week study period.

2.3 Procedure.

2.3.1 Initial Meeting and Briefing

After receiving IRB approval, participants who consented to participating in the study completed a demographics form. They then completed the Kentucky Inventory of Mindfulness Skills as a pre-intervention assessment of participants' mindfulness. When the intake form was completed, participants scheduled a meeting with the PI for an introduction into the study. Participants were given a brief overview on mindfulness and mindful practices before being introduced to the focused breathing exercise. The meeting concluded with a description of the weekly check-in form to report their completion rate and satisfaction/frustration, as well as their experience with the exercise.

2.3.2 Control vs Experimental Groups

Before the initial briefing, participants were randomly assigned to either a control or experimental group. Participants in both groups learned how to perform the focused breathing exercise and were instructed to complete the exercise daily for the following 5 weeks. These were the only instructions given to the control group. Participants in the experimental condition were given an additional disclaimer about the potential difficulty of the exercise and were encouraged to contact the PI if any difficulties or frustrations occurred during the course of the study. If a participant in the experimental group reported consistent moderate or high frustration for 2 weeks, or a low completion rate of fewer than 5 days in their weekly check-in, the PI would reach out to the participant and offer modifications to the exercise.

2.3.3 Conclusion of Study

Following 5 weeks of the study, all participants received a conclusion of study form along with their final weekly check-in. This form included another KIMS questionnaire to measure any changes to participants' mindfulness since their involvement in the study, some prompts to reflect on their experience with the exercise, and a study debriefing script.

3. Results

3.1 Participants

Although the study had 18 participants in total, the number of participants at the end of the study was 16. Two participants were excluded due to inconsistent weekly check-ins and a lack of data entered into the conclusion of study form. A total of 7 participants were male, 8 were female, 1 was non-binary, and 2 were genderfluid. 14 participants were between the ages of 18-24, 2 were between 37-43, 1 was between 44-50, and 1 preferred not to answer. When asked about their race/ethnicity, 1 participant was black/African American, 2 were Hispanic/Latino, 12 were white/caucasian, and 3 preferred not to answer. When asked to report their income, 5 participants were unemployed, 6 made between $0-$19,999, 1 made between $20,000-$29,999, and 6 preferred not to answer. When asked if they identified with a religious or spiritual group, 5 participants were Christian, 7 participants reported not identifying with a religious or spiritual group, and 6 reported themselves as spiritual and not religious.

3.2 Means and SD of Primary Variables

Before running statistical tests on KIMS scores, participant satisfaction and participation, means and standard deviations were gathered.

Pre-Study KIMS Scores

	Control or Experimental	N	Mean	Std. Deviation	Std. Error Mean
PreKIMSObserve	Control	8	40.6250	7.44384	2.63179
	Experimental	8	40.5000	6.80336	2.40535
PreKIMSDescribe	Control	8	25.6250	4.53360	1.60287
	Experimental	8	25.6250	4.53360	1.60287
PreKIMSActAware	Control	8	25.2500	4.49603	1.58959
	Experimental	8	26.3750	3.20435	1.13291
PreKIMSAccept	Control	8	23.7500	3.45378	1.22109
	Experimental	8	29.6250	7.48212	2.64533

Table 1. Sample size, mean, and standard deviation of KIMS subscores before the mindfulness intervention for control and experimental groups

Post-Study KIMS Scores

	Control or Experimental	N	Mean	Std. Deviation	Std. Error Mean
PostKIMSObserve	Control	8	42.8750	4.73400	1.67372
	Experimental	8	45.8750	9.17197	3.24278
PostKIMSDescribe	Control	8	27.7500	3.65474	1.29215
	Experimental	8	29.8750	3.87068	1.36849
PostKIMSActAware	Control	8	27.1250	4.54933	1.60843
	Experimental	8	27.8750	4.76408	1.68436
PostKIMSAccept	Control	8	28.1250	4.05101	1.43225
	Experimental	8	32.3750	5.92663	2.09538

Table 2. Sample size, mean, and standard deviation of KIMS subscores after the mindfulness intervention for control and experimental groups

Weekly Participant Satisfaction

Control or Experimental		Satisfaction Week 1	Satisfaction Week 2	Satisfaction Week 3	Satisfaction Week 4	Satisfaction Week 5
Control	Mean	4.78	5.33	5.78	5.11	5.89
	N	9	9	9	9	9
	Std. Deviation	1.093	.866	.441	.928	.928
Experimental	Mean	4.89	4.89	5.14	5.57	6.14
	N	9	9	7	7	7
	Std. Deviation	1.537	1.453	1.574	1.397	1.464

Table 3. Sample size, mean, and standard deviation of satisfaction scores for each week of the study

Weekly Completion Rate

Control or Experimental		Completion Rate Week 1	Completion Rate Week 2	Completion Rate Week 3	Completion Rate Week 4	Completion Rate Week 5
Control	Mean	4.89	5.22	7.00	6.22	6.22
	N	9	9	9	9	9
	Std. Deviation	1.691	1.093	1.118	1.302	1.302
Experimental	Mean	5.78	6.56	6.86	7.22	7.11
	N	9	9	7	9	9
	Std. Deviation	2.279	1.590	1.345	1.093	1.167

Table 4. Sample size, mean, and standard deviation of completion rates for each week of the study

3.3 Experimental Modifications

Over the course of the study, the PI reached out to 4 different participants in the experimental group a total of 7 times to offer modifications to the focused breathing exercise in response to consistent frustration or low completion rates. None of the participants accepted the offer to discuss their frustrations or difficulties with the

exercise, and as such, there were no modifications made to any of the experimental participants' mindfulness interventions.

3.4 KIMS Scores

One of the primary goals of this study was to investigate how providing modifications in response to feedback during a mindfulness intervention impacts the effectiveness of mindfulness interventions. A t-test with a two-sided p-value was used to compare pre-study KIMS scores between the control and experimental groups.

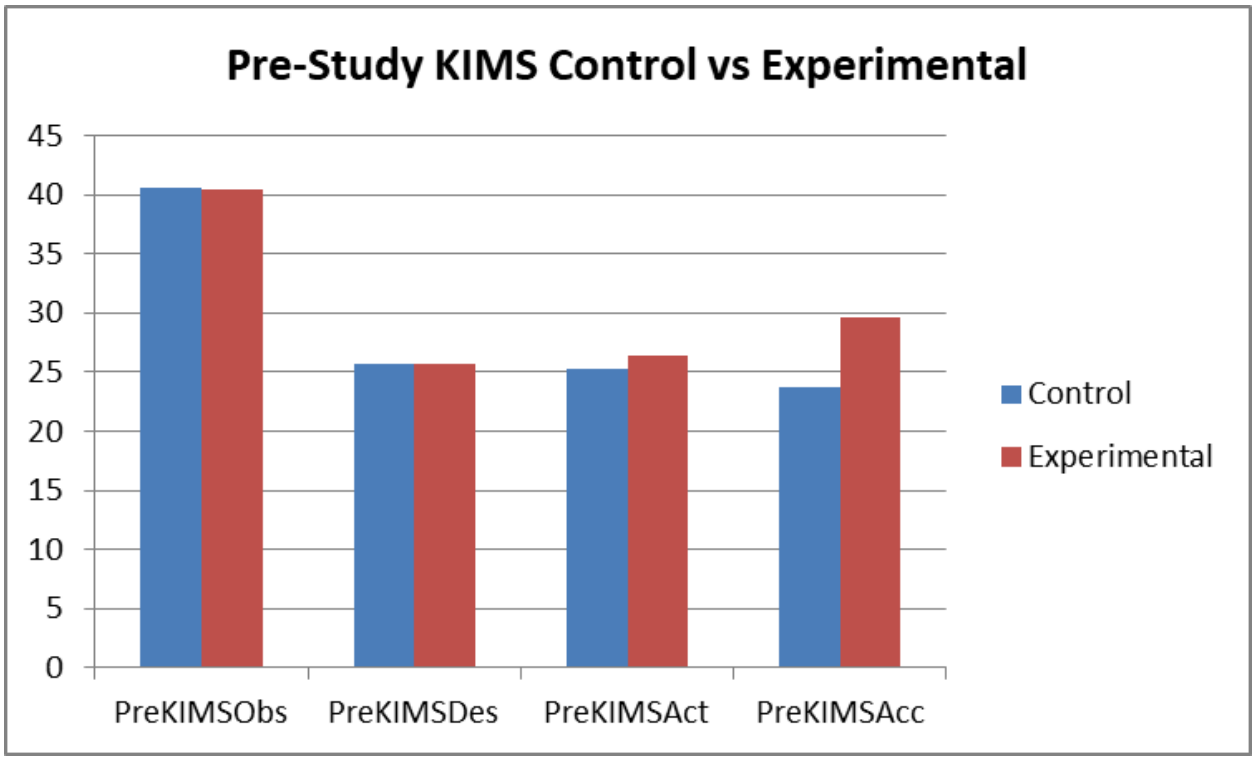

Figure 1. Comparison of KIMS scores between control and experimental groups before the mindfulness intervention

Tests of PreKIMS scores indicated no significant differences in mindfulness scores between control and experimental groups before mindfulness intervention. PreKIMSObserve $t(14)=.035$, $p=.973$. PreKIMSDescribe $t(14)=.000$, $p=1.000$. PreKIMSActAware $t(14)=-.576$, $p=.574$. PreKIMSAccept $t(14)=-2.016$, $p=.063$.

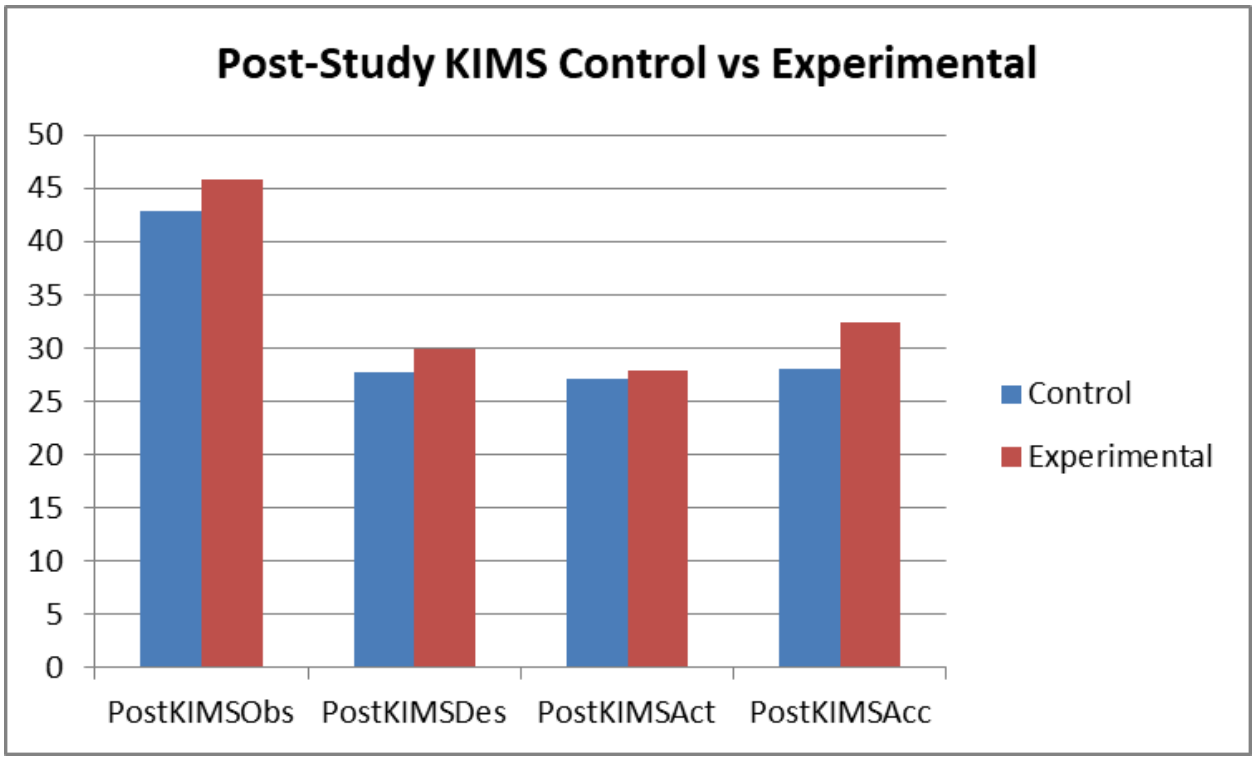

Figure 2. Comparison of KIMS scores between control and experimental groups after the mindfulness intervention

A t-test was used to compare post-study KIMS scores between the control and experimental groups and found no significant differences. PostKIMSObserve $t(14)=-.822$, $p=.212$. PostKIMSDescribe $t(14)=-1.129$, $p=.139$. PostKIMSActAware $t(14)=-.322$, $p=.376$. PostKIMSAccept $t(14)=-1.674$, $p=.058$

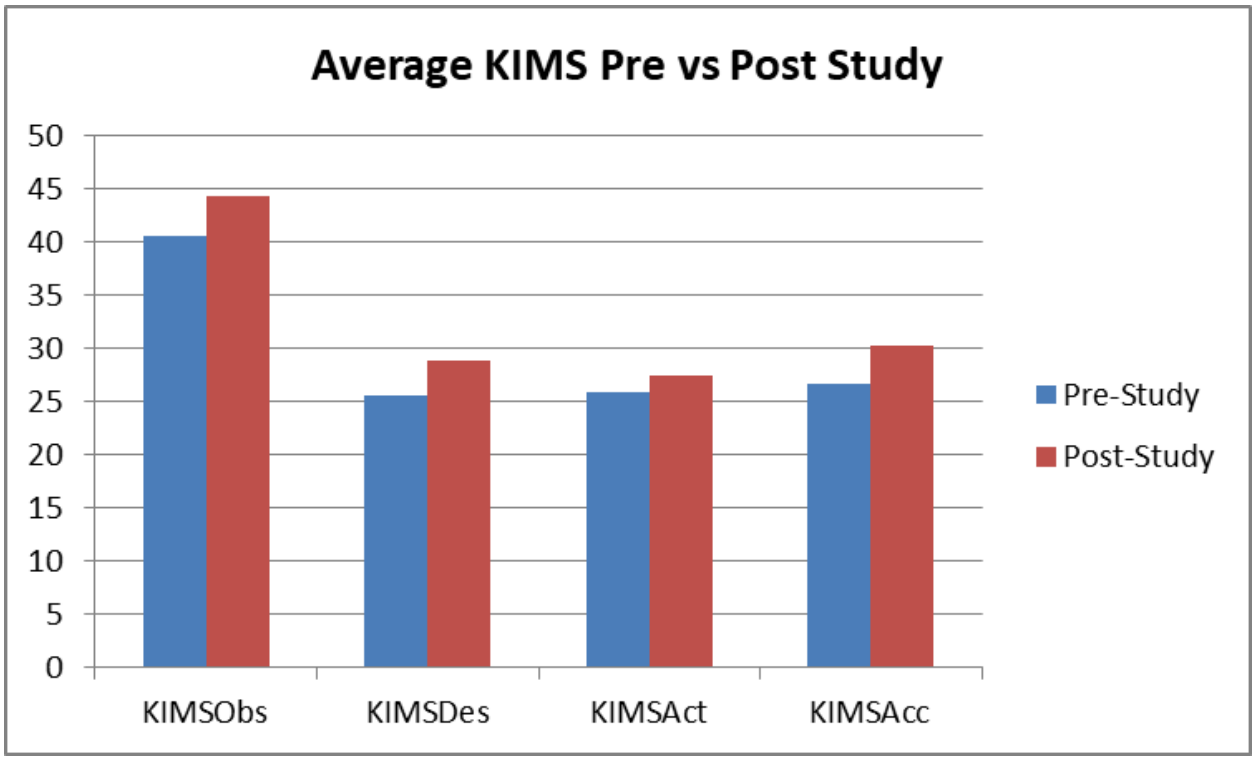

Figure 3. Comparison of average KIMS score before and after the mindfulness intervention

A paired-samples t-test found significant differences between pre- and post-study KIMS scores across both control and experimental groups, with all post-study scores being significantly higher. KIMSObserve $t(15)=-2.222$, $p=.021$. KIMSDescribe $t(15)=-2.369$, $p=.016$. KIMSActAware $t(15)=-1.749$, $p=.050$. KIMSAccept $t(15)=-2.774$, $p=.007$

3.5 Satisfaction

Another goal of this study was to investigate how providing modifications in response to feedback during a mindfulness intervention impacts participant satisfaction with mindfulness interventions.

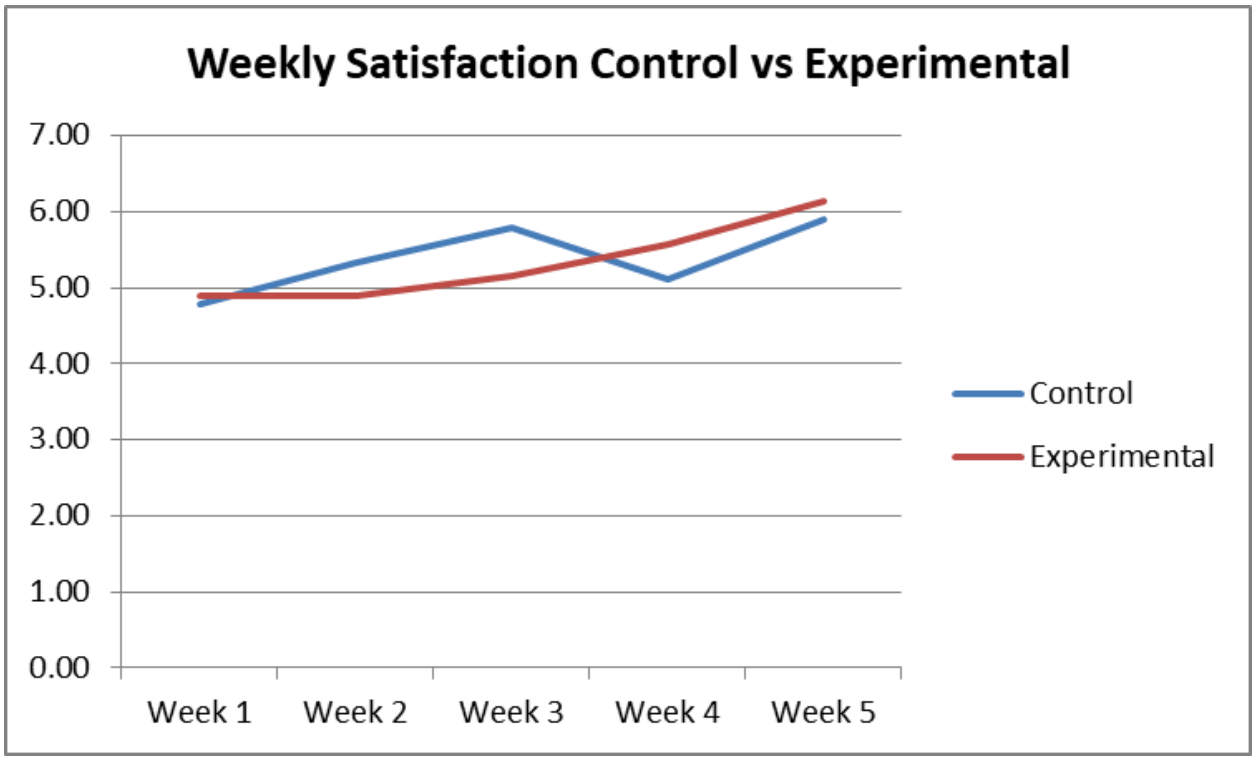

Figure 4. Comparison of satisfaction scores each week between control and experimental groups

T-tests of weekly satisfaction scores showed no significant differences between control and experimental groups. wk1Satisfaction t(16)=-.177, p=.431. wk2Satisfaction t(16)=.788, p=.221. wk3Satisfaction t(14)=1.164, p=.132. wk4Satisfaction t(14)=-.792, p=.221. wk5Satisfaction t(14)=-.424, p=.339.

3.6 Participation

The last goal of this study was to investigate how providing modifications in response to feedback during a mindfulness intervention impacts participant engagement with mindfulness interventions.

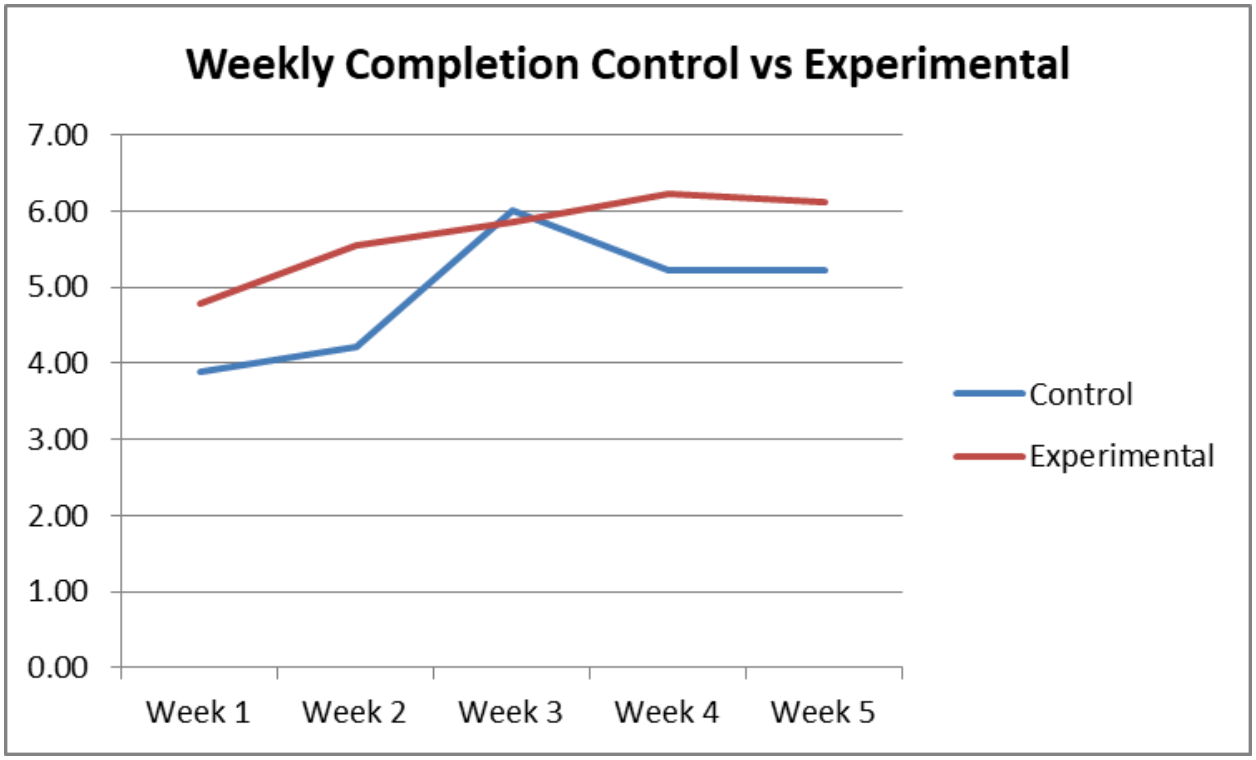

Figure 5. Comparison of completion rates each week between control and experimental groups

T-tests of weekly completion rates showed varied differences between control and experimental groups, with week 2 and 4 being significant. wk1Completion t(16)=-.940, p=.181. wk2Completion t(16)=-2.073, p=.027. wk3Completion t(14)=.232, p=.410. wk4Completion t(16)=-1.765, p=.048. wk5Completion t(16)=-1.526, p=.073.

4. Discussion

4.1 Participants

This study collected demographic information from 18 participants, regarding age, gender, race/ethnicity, income, and religious/spiritual beliefs. There was a nearly even amount of males and females, with some participants reporting as non-binary or genderfluid/non-conforming. There was also a pretty even distribution of participants that were not religious, Christian, and spiritual. A majority of participants were between the ages of 18-24, white, and unemployed or low-income. There is not substantial data to suggest that this would have greatly impacted the findings of this study, but the low sample size and low variety of participants makes it difficult to generalize the findings of this study with confidence.

4.2 Experimental Modifications

The main independent variable used in this study is the experimental group's potential to receive modifications to their mindfulness intervention after discussing difficulties or frustrations with their exercise with the PI. In this study, no participants in the experimental group directly spoke with the PI about adapting their exercise in response to difficulty or frustration, despite the PI reaching out in response to some participants' reports of experiencing such. As a result of this, there were no modifications to the mindfulness intervention for any experimental participants, and as such any differences in intervention outcomes between experimental and control groups will be difficult to find. In a future study this could be improved by a change in study design, perhaps where a meeting with a researcher would be required (instead of offered) in response to reported frustration or difficulty. Additionally, investigating a different population that is more engaged in the process and outcomes of their mindfulness intervention, such as individuals involved in a formal MBI, may yield stronger results.

4.3 Intervention Effectiveness

This study failed to find evidence that providing modifications in response to feedback during a mindfulness intervention results in a significant difference in the effectiveness of those interventions. However, although there was no significant difference between control and experimental groups for post-study KIMS scores, we found a significant increase between pre/post intervention scores across both groups. Although this study failed to find a difference in effectiveness between the two groups, the study found that the daily practice of a focused breathing exercise across a 5-week period leads to a significant increase in core mindfulness skills of observing, describing, acting with awareness, and accepting without judgement.

4.4 Satisfaction

This study failed to find evidence that providing modifications in response to feedback during a mindfulness intervention results in a significant increase in participants' satisfaction with their intervention. In general, participants reported slight to moderate satisfaction with their exercise, with many reporting that the exercise was peaceful, grounding, and provided some relaxation during or after their day. Those who reported frustration mainly struggled with maintaining focus and would get upset when their mind would wander. Although there was no significant difference between groups, participants were mostly satisfied with the exercise and found some value in it.

4.5 Participation

This study failed to find evidence that providing modifications in response to feedback during a mindfulness intervention results in a significant increase in participants' engagement with their intervention. Completion rates were moderate, with many participants consistently missing a few days and some missing many more. Common barriers to completion reported by participants were busyness and forgetfulness. These results and reports reflect the challenges and limitations of a self-directed intervention, as there are no external factors to hold one accountable.

4.6 Limitations

This study was conducted in a small liberal arts school with a small sample size of mostly young, white, low-income participants. It is difficult to generalize the results of this study, or draw comparisons to a clinical population. The results of this study are weakened by its design that allowed for multiple participants who reported consistent frustration or low completion rate to complete their intervention without any modifications. Any similar future studies should require at least a discussion between participants and the PI in response to reports of frustration or lack of engagement. A lack of a participant group that did not undergo a mindfulness intervention means that there is not a control baseline to compare the significant increase in KIMS scores against, which would have further strengthened supporting evidence for the effectiveness of mindfulness interventions.

4.7 Implications

A major implication of this study for clinical applications is that simple, self-directed mindfulness interventions can be effective for developing skills that are core to mindfulness. These interventions do not need to be very long or intensive, as there were significant results after only 5 weeks of daily 10 minute exercise. While more thorough MBIs will likely be more effective for specific cases, simple exercises can make an excellent addition to most care provider's resources, from physical therapists to social workers.

5. Conclusion

The purpose of this study was to investigate how responding to participant feedback during a mindfulness intervention impacts the effectiveness of mindfulness interventions, as well as participants' experience and engagement with the intervention. Although this study found no significant evidence for the impacts of intervention modifications on effectiveness and participant satisfaction or engagement, there is still strong evidence supporting the effectiveness of self-directed mindfulness interventions. Many participants across both control and experimental groups reported satisfaction and positive effects associated with their intervention and there was a significant increase in overall KIMS scores. These findings support the general effectiveness of mindfulness interventions that is found in other studies. The original research questions of this study should be investigated further with refined study design and with a larger and a clinical or more generalizable population.

6. Acknowledgements

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