

EFFECTIVENESS OF AN ONLINE SELF-HELP PROGRAM (MIND-OP) IN REDUCING
ANXIETY, DEPRESSION, AND STRESS: MEDIATING ROLE OF MIND-WANDERING

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Abstract

In the current study, I assessed the effectiveness of a newly created brief online mindfulness program titled Mindfulness and Self Compassion Online Program (Mind-OP) in reducing depression, anxiety, and subjective stress in a student sample. I also examined if the program worked to reduce mental health symptoms through reductions in mind wandering, which is when one is engaged in a task yet their mind is focused on task unrelated thoughts. A total of 184 participants were recruited from the University of Regina's research participation pool to participate in this six-week longitudinal trial; however, a total of 92 were retained for analyses due to errors in data collection and retention rates. Results indicated that that Mind-OP was effective in significantly reducing symptoms of depression, anxiety, and stress, as well as increasing levels of self-compassion. There was no significant mediation effect of mind wandering; however, this analysis was extremely underpowered. Results of the present study suggest that Mind-OP, a brief mindfulness and self-compassion intervention administered online, may be beneficial for mild-moderate mental health symptoms; however, larger and more definitive studies are required to replicate the findings. Accordingly, plans of replication and extension to other populations are under way.

Keywords: Depression, Anxiety, Stress, Mind Wandering, Mindfulness, Self-Compassion

Effectiveness of an Online Self-Help Program (Mind-OP) in Reducing Anxiety, Depression, and
Stress: Mediating Role of Mind-Wandering

Depression and anxiety are mental health issues that can severely impact individual functioning and may result in far reaching individual and social consequences. As both depression and anxiety are usually coupled with heightened stress, people who experience depression, anxiety, and a high level of subjective stress may encounter many problems in meeting the everyday requirements that their life necessitates. In consideration of this, lowering the symptoms of depression and anxiety as well as lowering subjective stress are of high value in today's fast-paced, stressful world. The university population is of keen interest when considering depression, anxiety, and heightened stress due to the average age of entry as well as the workload they are expected to maintain.

Students who attend higher learning institutions tend to be at the age where they are already vulnerable to developing a psychological disorder due to the fact that most disorders have peak onsets between the ages of 18 to 25 years (Brown, 2016). As these years are typically when students enter these institutions, on average, 80% of students will fall into this bracket (Brown, 2016). This vulnerability coupled with the fact that post-secondary students experience their own set of stressors due to the unique demands of higher education may increase their risk to develop anxiety and depression. In a sample of university students from the United States, researchers (Beiter et al., 2015) found that almost 10% had been diagnosed with or treated for depression within the past year; however, researchers have noted that only about one in five people with moderate depression, and one in three people experiencing severe depression seek help (Siegel, Lienemann, & Rosenberg, 2017). This draws to the conclusion that 10% is a very low estimate of the number of students suffering. In one university sample, researchers found

that depression and anxiety were the most common reasons why students seek help (Krumrei, Newton, & Kim, 2010); therefore, university students are especially vulnerable to experience both depression and anxiety.

Although university students are at a heightened risk to experience depression and anxiety, they also face barriers in accessing treatment which prevents them from getting the help required. Researchers found that the strongest impediment in college students seeking help was the cost of treatment (Bohon, Cotter, Kravitz, Cello, & Fernandez Garcia, 2016). In addition to the high cost of treatment, self-stigma has also been shown as a barrier in university students help-seeking (Cage, Stock, Sharpington, Pitman, & Batchelor, 2018). Furthermore, Cage et al found that as depressive symptoms increase, the willingness to seek help often decreases (Cage et al., 2018), leading those with higher symptomology to suffer in silence. Other factors such as financial availability (Andersson et al., 2013), location (Dew et al., 2013), or the belief that experiencing these symptoms are normal (Cage et al., 2018), may all impact why students do not seek help for their symptoms.

Because of the vulnerability concerning the student population in experiencing anxiety, depression, and heightened stress, the current study seeks to examine the effectiveness of a newly created brief online program, which will assist in decreasing the barriers for those experiencing the above-mentioned symptoms. This program utilizes mindfulness meditations as well as self-compassion exercises, can be done in the comfort of people's homes at a time convenient to them, and is widely accessible. Accordingly, several barriers that many people face in accessing mental health assistance are addressed by this program (discussed in the Method section). The first research question thereby is, will participation in a brief online

program (Mindfulness and Self Compassion Online Program -Mind-OP for short) reduce symptoms of depression, anxiety, and stress?

Mindfulness

Mindfulness has been defined as paying attention to present moment experiences with purpose, openness, and without judgment (Kabat-Zinn, 2015). Shapiro, Carlson, and Freedman (2006) further theorized that at its core, mindfulness contains three components or axioms. These are intention, attention, and attitude. These three axioms can be seen in the definition given by Kabat-Zinn, in that, intention relates to the purpose, attention relates to paying attention to one's experiences, and attitude relates to being non-judgmental, non-reactive, and openhearted. Furthermore, Bishop (2004) has proposed a two-component model which distinguishes the importance of both the self-regulation of attention (intention and attention aspects) as well as adopting a particular orientation towards experience (attitude aspect). The self-regulation of attention is important as one must be able to sustain attention and awareness in the present moment. In the second component one must adopt a particular orientation or attitude toward their experience; this is characterized by acceptance, openness, and curiosity.

Mindfulness is seen as a trait (dispositional mindfulness), a state (can experience states of being mindful), as well as a concept. Dispositional mindfulness has been studied in a variety of populations and has shown to be correlated to many mental health related constructs. Researchers have shown that those higher in dispositional mindfulness were better able to manage negative emotions, with the same study finding an inverse relationship between dispositional mindfulness and psychological distress (Coffey & Hartman, 2008). Mindfulness has been found to be significantly correlated with high self-esteem and negatively correlated

with social anxiety (Rasmussen & Pidgeon, 2011). Dispositional mindfulness has also been associated with a better quality of sleep, eating habits, and better overall physical health (Murphy, Mermelstein, Edwards, & Gidycz, 2012), as well as negatively correlated with depressive and anxiety symptoms (Barnes & Lynn, 2010; Bränström, Duncan, & Moskowitz, 2011). In a systematic review conducted in 2018, researchers looked at 21 research articles (looking at dispositional mindfulness with depressive symptoms as an outcome measure) and every article found a negative relationship between dispositional mindfulness and depressive symptoms (Tomlinson, Yousaf, Vittersø, & Jones, 2018). Further to this, the same review found that dispositional mindfulness was negatively associated with social anxiety, state anxiety, and trait anxiety (2018).

Brown and Ryan (2003) found that both state mindfulness as well as dispositional mindfulness predicted self-regulated behavior. Mindfulness interventions have been shown to decrease the symptoms of depression, anxiety, and reduce subjective stress in a number of populations (Falsafi, 2016; Marchand, 2012; Maxwell & Duff, 2016; McIndoo, File, Preddy, Clark, & Hopko, 2016; Song & Lindquist, 2015). Mindfulness interventions have also shown to help patients achieve more compassion for self and others, a deeper longer lasting sense of happiness, as well as a better sense of life purpose (Song & Lindquist, 2015). Cheisa (2013) also reviewed that interventions that are based in mindfulness can impact chronic pain, mood and anxiety disorders, and psychological symptoms of cancer patients.

Self-Compassion

Self -compassion has been defined as one's capacity to be moved by their own suffering as well as the desire to alleviate it (Neff 2003). It involves being open to one's suffering, as well as seeing one's experiences as a part of the larger common human experience. Neff further

breaks self-compassion down into three main components: Self Kindness, Common Humanity, and Mindfulness of negative experiences (Neff, 2003). According to Neff, Self-Kindness involves being kind as well as extending understanding to ourselves instead of being overly critical or judging toward ourselves. Common-Humanity is the capacity to see negative experiences as part of the human experience rather than seeing them as isolating from others. The last component, Mindfulness of negative experiences, requires one to hold their painful thoughts and feelings in awareness without overidentifying or becoming attached with them.

Krieger, Berger, & Holtforth (2016) found that a lack of self-compassion significantly predicted depressive symptoms and noted that higher levels of self-compassion are associated with lower levels of rumination, worrying, or avoidance behavior. In another study it was found that greater self-compassion was associated with lower levels of depression, anxiety, and stress (Macbeth & Gumley, 2012). Beshai, Prentice, and Huang (2018) also found that self-compassion is significantly negatively correlated with depressive symptoms and that it may serve to enhance emotional resilience. Therefore, self-compassion may be an effective tool in increasing wellbeing and decreasing the symptoms of anxiety and depression while also reducing heightened levels of stress.

Mind Wandering

Mind wandering is defined as a shift of one's attention from a task to unrelated concerns (Mrazek, Franklin, Phillips, Baird, & Schooler, 2013). It is the periodic shifting of attention away from the task at hand. Accordingly, mind wandering is also referred to as daydreaming or not paying attention to the present moment. It has been shown that mind wandering carries a few benefits such as increased creativity and relief from boredom (Mooneyham & Schooler, 2013);

however, researchers have documented considerably more costs than benefits associated with mind wandering.

Researchers have shown that mind wandering can lead to decreases in reading comprehension, working memory capacity, intelligence testing, and sustained attention (Mooneyham et al, 2013; Mrazek, Franklin, Phillips, Baird, & Schooler, 2013). In addition to these negative correlates, the tendency to mind wander is also associated with negative affect; the more one mind wanders, the unhappier they seem to be (Killingsworth & Gilbert 2010; Smallwood, Nind, & O'Connor, 2009; Smallwood, Fitzgerald, Miles, & Phillips, 2009). Mind wandering has also been associated with decreased states of mindfulness (Mrazek et al., 2012; Mrazek, Franklin, Phillips, Baird, & Schooler, 2014), as well as an increased risk to experience the symptoms of depression (Deng, Li, Tang, 2012; Smallwood, Nind, & O'Connor, 2009; Watts, Macleod, & Morris, 1988; Smallwood, Fitzgerald, Miles, & Phillips, 2009; Smallwood & O'Connor, 2011, ; & Killingsworth & Gilbert, 2010).

Mind wandering is common; Killingsworth & Gilbert (2010) found that our minds can engage in mind wandering for up to 50% of our waking day. In addition to the above-mentioned associations in relation to cognition and affect, it has also been associated with mindfulness. Mindfulness training has improved GRE scores through lowering the occurrence of mind wandering (Mrazek et al. 2013), hence mind wandering acting as the mediator. Mrazek and colleagues (2012) found that individuals who report high levels of mindfulness also report less daydreaming. In addition to this, it was found that a brief mindfulness intervention reduced mind wandering.

Given these lines of evidence regarding the pernicious effects of mind-wandering on mental health, it is reasonable to suggest that lowering mind wandering may be an important goal

of mindfulness interventions. The benefits of lowering the mind-wandering will likely also have a significant impact on students, who require much focus and attention for successful navigation of University tasks. Due to these correlations with both mindfulness as well as depressive symptomology, this study seeks to investigate whether mindfulness's effect on depressive symptomology is mediated by the reduction in mind wandering. Therefore, the second research question is: If Mind-Op has an effect on depressive symptomology, is this effect mediated by the reduction of mind wandering?

Current Study

The above reviewed literature suggests that both mindfulness interventions as well as self-compassion practice may be effective in reducing depression and anxiety symptoms, as well as decreasing subjective levels of stress. Beyond this, the literature also supports that mindfulness-based interventions aid in reducing the tendency to mind-wander (with reductions in mind wandering related to positive affect). Accordingly, we have designed a program that utilizes mindfulness meditations and self-compassion practices to help users experience relief from depression and anxiety, as well as lower subjective stress.

We predict that this program will decrease symptoms of depression and anxiety while also lowering subjective stress. In addition, we predict this reduction in symptoms will be mediated by the reduction in mind-wandering. This is an important study as it not only removes barriers that subjects experience (which comes along with the nature of these symptoms, as well as external barriers such as the cost of treatment or stigmatization), which will give more access to this sample in receiving mental help. This study will also be the first of its kind to offer online therapy using both mindfulness meditations and self-compassion exercises together in a university sample.

Method

Participants

A total of 184 participants took the pre-screening questionnaire. Out of these, 53 were ineligible to continue, 36 participants dropped out of the study, and 95 participants completed the study. Three of the participants who completed the study did not consent to data use, therefore our final analyses were run on the remaining 92 participants (see appendix A for a flowchart of participant retention.) Due to an error in data collection each participant did not receive every questionnaire, resulting in a different number of participants completing each individual scale. The following are the completion rates of both pre and post measures: 21 participants completed both pre and post MWQ, 32 participants completed both pre and post GAD-7, 49 participants completed both pre and post PHQ-9, 44 participants completed both pre and post PSS, 32 participants completed both pre and post SCS, and 53 participants completed both pre and post FFMQ.

Participants were all post-secondary students, 18 years of age, proficient in the English language, and experiencing moderate levels of either depression, anxiety, or stress. Average age was 23 years old ($SD= 6.9$ years). 75% of participants were females (69) and the remaining 25% were males (23). Participants received one bonus credit towards their 100-200 level psychology course or \$10.00 cash for completing the pre-screening testing which determined eligibility to continue in the study. Those that qualified and finished the entirety of the study were compensated with either an additional 2 bonus credits towards a 100-200 level psychology course or an additional \$30.00 cash.

Main Outcome Measures

The Generalized Anxiety Disorder-7 (GAD-7) was used to measure anxiety symptoms. The GAD-7 is a seven-item self-report Likert scale which includes questions such as, “over the last 2 weeks how often have you been bothered by feeling nervous, anxious, or on edge.” This is a 4-point Likert scale from “0” or “*Not at all*” to “3” or “*Several days*”, with higher scores being indicative of greater anxiety symptoms. This scale is reliable and valid when used in a student sample (Bártolo, Monteiro, & Pereira, 2017).

The Patient Health Questionnaire-9 (PHQ-9) was used for the screening of depressive symptoms. The PHQ-9 is a nine item self-report Likert scale and includes questions such as, “over the past two weeks how often have you been bothered by poor appetite or eating, feeling tired or having little energy,”. These questions are rated on 4-point Likert scale from “0” or “*Not at all*” to “3” or “*Nearly Every Day*”, with higher scores indicating greater depression symptoms. This measure is both reliable and valid for use in a student sample. (Adewuya, Ola, & Afolabi, 2006).

The Perceived Stress Scale (PSS) was used to measure the degree to which individuals rate their stress levels within the past four weeks. It is a 10-item, 4-point Likert scale from “0” or “*Never*” to “4” or “*Very often*” with higher scores indicative of higher experienced stress. This scale is reliable and valid when used in a college sample (Lee, 2012).

Secondary Outcome Measures

The Short Form of the Five-Facet Mindfulness Questionnaire (FFMQ) was used to measure participants levels of mindfulness. This is a 15-item Likert scale which asks participants to rate what is generally true for them and ranges from “*Never or Rarely True*” or “1” to “*Very often or Always True*” or “5”, with three points in between, with higher scores

indicative of higher levels of mindfulness. This scale is both reliable and valid when used in a student sample (Christopher, Neuser, Michael, & Baitmangalkar, 2012).

The Short Form of the Self Compassion Scale (SCS) was used to measure Self-Compassion. It is a 12 item 5-point Likert Scale which asks participants to answer questions regarding how they typically act towards themselves during difficult times. Scoring ranges from “*Almost never*” or “1” to “*Almost always*” or “5”, with higher scores indicative of higher levels of Self Compassion. This scale is both valid and reliable for use in a student sample (Raes, Pommier, Neff, & Van Gucht, 2011)

The Mind Wandering Questionnaire (MWQ) was used to measure mind wandering. This is a 5-item self-report Likert scale that asks questions such as, “I do things without paying full attention,” and, “I find myself listening with one ear, thinking about something else at the same time.” Scoring ranges from “*Almost never*” or “1” to “*Almost Always*” or “6”, with higher scores indicative of an increased tendency to mind wander. This scale is both reliable and valid for use in a university sample (Mrazek, Phillips, Franklin, Broadway, & Schooler, 2013).

Demographic variables were also collected. These are Gender (“Man”, “Woman”, or “Other”), ethnicity, and year of study (“1st”, “2nd”, “3rd”, “4th”, or “5th or higher”). Participants will also be asked if they have ever been diagnosed with a mental health diagnosis, and if they have ever meditated before.

Intervention: Mind-OP

The Mindfulness and Self Compassion Online Program (Mind-OP) is a newly created, brief online program. Mind-OP utilizes mindfulness meditations and self-compassion exercises with the intention of lowering the symptoms of depression and anxiety and reducing subjective

stress. This program was created by Dr. Shadi Beshai and colleagues at the University of Regina; this is a pilot project to assess its effectiveness in a university sample.

Mind-OP consists of four modules that are intended to be completed at a pace of one module per week, making this program 4 weeks in duration. Each module contains psychoeducational videos that provide information about mindfulness and self-compassion. The modules also contain mindfulness meditations and self-compassion exercises for the participant to engage in. Recommendations are given to practice the meditations a few times per week. In order to motivate this practice, embedded into the modules are motivational interviewing and behavioral exercises where participants choose dates and times in which they are committed to practicing in the middle of the week, while also anticipating issues which may prevent the additional practice.

Module one contains two psychoeducational videos, one that introduces the topics of depression, stress, anxiety, and another introducing mindfulness. The first module also contains one mindfulness meditation exercise which focuses on the breath. Module two contains two psychoeducational videos, one on mindful awareness of body and one on mindful awareness of thoughts, as well as two meditative exercises to practice each of such concepts. The third module introduces Self-Compassion in two psychoeducational videos followed by two Self-Compassion exercises. The first Self-Compassion exercise is on mindful noticing of emotions, with the second focusing on common humanity. The fourth module continues to educate about Self-Compassion and contains two Self-Compassion exercises for the participant to engage in. Therefore, each module contains both educational videos to teach about the concepts as well as exercises for the participants to practice the concepts. It was highly recommended that participants practice these meditations throughout the week.

Procedure

This study was completed entirely online through the survey software Qualtrics. Participants provided informed consent before filling out the pre-testing screening questionnaires to gain baseline scores and determine eligibility. The pre-testing screening package included 1) demographic questions, 2) the GAD-7, 3) the PHQ-9, 4) the PSS 5) the Short Form of the FFMQ, 6) the Short Form SCS, and 7) the MWQ. Upon completion of the battery of pre-testing screening questionnaires, scores were calculated on each main outcome measure to determine if participants were eligible to continue in the study. Eligibility required that participants score moderately on either the PHQ-9 and GAD-7 (score of 8 or higher) or score 14 or higher for the PSS. Ineligible participants were debriefed on the battery of tests they completed, were given access to the Mind-OP modules and received the compensation they choose (\$10.00 cash or 1 participant pool credit).

Eligible participants were assigned participant numbers and randomized into the experimental or waitlist control condition. Randomization was done using randomizer.org, using a process where participant numbers would be assigned with either a “1” or “2” with a “1” indicating the experimental group and “2” being indicative of the control group. Participants were recruited over 8 waves, and each wave of the study started on a Monday, therefore, eligible participants were first emailed on the Friday prior to their start date.

Participants in the experimental group were provided with the weekly Mind-OP module on Monday of each week. If they had not completed the module by Thursday, they were sent a reminder email. If the module was still not completed by the Saturday an additional reminder was sent. In addition to the modules, the experimental group was also monitored weekly on their

levels of depression, stress, and anxiety using the same measures in the pre-screening (PHQ-9, PSS, and GAD-7, respectively). These measures were embedded into the modules.

The control condition was told they were being placed on a waitlist, and their symptoms were also monitored weekly in parallel to the intervention group (PHQ-9, PSS, and GAD-7). Measures were also sent out on Mondays with reminders to complete them if they had not been finished by the Thursday, and again on the Saturday. After four weeks of either the intervention or waitlist condition, participants in both conditions also completed a post-treatment package which included all measures included in the pre-screening questionnaire (PHQ-9, The GAD-7, The PSS, the MWQ, The Short Form of the SCS, and The Short Form of the FFMQ). In completion of these, participants were granted their choice of compensation as well as debriefed on the study. For ethical reasons, the waitlist control condition was sent the intervention modules at the end of each wave. The study was six weeks in total duration: the first week for the pre-screening eligibility, weeks two to five for the Mind-OP intervention, with completion ending on the sixth week with the post-program questionnaires.

Analyses.

All analyses were conducted using Statistical Package for the Social Sciences (SPSS) software. For hypothesis A (Participation in Mind-OP will decrease the symptoms of depression and anxiety and reduce perceived stress in a university sample) a repeated-measures analysis of variance (ANOVA) was conducted. This was used to detect differences in between-subject's groups (experimental and control) across time (pre vs. post scores) on main outcome measures. Exploratory tests were conducted using paired samples t-tests.

For hypothesis B (the change will be mediated by the effect of mindfulness on mind wandering) a Structured Equation Model Path Analysis was conducted used the PROCESS

Macro of SPSS to infer a causal relationship between the constructs. Follow-up paired samples t-tests were run.

Results

Depression

A repeated-measures ANOVA was conducted to analyze Mind-Op's effect on depressive symptomology. A total of 49 participants completed the pre- and post-PHQ-9, and results indicate a statistically significant effect for time, $F(1, 19) = 9.43, p = .004, \eta^2_{\text{partial}} = .167$. An interaction was approaching but not reached, $F(1,19) = 3.6, p = .06, \eta^2_{\text{partial}} = .018$. As planned, an exploratory analysis was conducted using a paired samples t-test with results for the PHQ-9 indicating a significant decrease in depressive symptomology for the experimental group, $t(21) = 2.75, p = .012, d = .49$. There was no significant decrease in depressive symptomology for the control condition, $t(26) = 1.57, p = .129, d = .29$.

Anxiety

Repeated measures ANOVA was conducted for anxiety. A total of 34 participants completed both pre and post GAD-7, results indicate a significant effect for time, $F(1, 14) = 10.43, p = .003, \eta^2_{\text{partial}} = .258$. The analysis suggested a significant interaction effect between the control and experimental group over time, with the experimental group experiencing a statistically significant reduction in anxiety symptomology in comparison to the control condition, $F(1, 14) = 11.01, p = .002, \eta^2_{\text{partial}} = .268$. See Appendix C for a plot of the interaction. Further, an exploratory paired samples t-test was run for the GAD-7 and results indicate a significant decrease in anxiety symptomology for the experimental group, $t(17) = 5.74, p < .001, d = .94$. There was no significant decrease in anxiety symptoms for the control condition, $t(13) = .051, p = .960, d = .018$.

Perceived Stress.

Repeated measures ANOVA was conducted for perceived stress. A total of 44 participants completed both pre and post-PSS, results indicate a significant effect for time, $F(1, 22) = 4.91, p < .03, \eta^2_{\text{partial}} = .105$. An exploratory paired samples t-test was run on both the experimental and control conditions and found a significant decrease in stress for the experimental group, $t(22) = 5.25, p = .02, d = .51$. There was no significant decrease in subjective stress for the control condition, $t(20) = .497, p = .624, d = .11$

Self-Compassion

A paired samples t-test was run for self-compassion scores, and results indicate a significant increase in scores for the experimental group, $t(17) = 3.32, p = .004, d = .62$. There was no significant effect for the control condition, $t(13) = .630, p = .540, d = .15$.

Mindfulness

Results from a paired samples t-test run on the FFMQ-15 shows no significant results found for the experimental condition, $t(19) = 1.39, p = .182, d = .38$, nor the control condition, $t(31) = 1.67, p = .104, d = .30$.

Mind-Wandering

A paired samples t-test was conducted for mind wandering with no significant results being found for the experimental condition, $t(16) = 1.23, p = .240, d = .37$, nor the control condition, $t(28) = .952, p = .349, d = .21$.

As planned, a mediation analysis was conducted and results suggested that decreases in depression were not due to the mediating role of mind wandering. The results from the structured equation model path analysis in relation to the mediating role of mind wandering on depression shows insignificance, indirect = $-.022, SE = .518, 95\% \text{ CI } [-.902, 1.182]$, mind

wandering scores on the pre-screening did not mediate post depressive scores, nor did post mind wandering scores mediate post depressive scores, indirect = $-.366$, $SE = 1.54$, 95% CL $[-3.48, 2.96]$. The overall model did not show any support for mind-wandering mediating the decrease in depressive symptoms, indirect = $.058$, $SE = .453$, 95% CL $[-.748, 1.21]$.

Discussion

In this study, I found partial support for the effectiveness of Mind-Op in reducing stress, anxiety, and depression in this university sample. Furthermore, engagement in Mind-Op also increased levels of self-compassion. These findings support the first hypothesis, that Mind-Op will reduce depressive and anxiety symptomology and lower subjective levels of stress. Knowing that this intervention was effective in reducing psychological distress is important as this program can further be used as a tool to promote psychological wellbeing. Mind-Op reduces barriers that many people face in attempting to deal with their depression, anxiety, and stress. By having access to Mind-Op students will not have to pay out of pocket for psychotherapy, leave their home or dorm room to attend appointments, face the stigmatization that comes with receiving therapy, and can schedule in practice times on their own accord. These benefits can extend to other populations.

Although Mind-Op was effective in reducing stress, anxiety, and depression in the student sample, it is recommended that this be replicated as well as tested in other populations to assume that the same effect will be found elsewhere. Testing this intervention in populations that are most affected by the barriers experienced in receiving mental health treatment may be a good starting point. Lower income populations, single parents, populations with no health insurance, populations that are living in rural or closed off areas, as well as those dealing with extreme

states of depression, stress, and anxiety may benefit greatly, although hopefully these effects may be felt by everyone.

Although there was an effect found for the main outcome variables, there was no mediation effect found for mind wandering. This may be due to the very low power that was observed in running the mediation analysis. In the creation of the surveys on Qualtrics, an error was made that had not been known until the study had ended. This error resulted in a systemic impact where in the pre-screening questionnaire as well as the post-study questionnaire 4 of the scales were not shown to each participant. Because of this error, there were not enough participants who had completed the Mind Wandering Questionnaire to properly power the mediation analysis. This error has since been fixed and participants have continued to be recruited to gain additional power in running these analyses.

These results are promising in regards to providing partial relief for those experiencing depression, anxiety, and stress. As the personal and social impact is extensive, this research is important. This is the first study to look at the effectiveness of Mindfulness and Self-Compassion therapy in a brief online format. As students are faced with such high vulnerability regarding their psychological health, the creation of this program may both reach and impact students in alleviating these negative symptoms. The impact on people's psychological health can be improved and those who are faced with barriers in improving their mental well-being may be greatly impacted by this program.

Limitations

This study faced multiple limitations. Due to the error made in the creation of the questionnaires our sample size was low and therefore many of our analysis were decreased in power. Although 92 participants finished the entire 6-week study, those who actually completed

each individual pre and post measure was greatly reduced. Due to this, analyzing data individually and collectively is complicated. Because of the sample size, it brings into question if certain results that were found to be nonsignificant are due to the intervention, or because of this reduced power.

Another limitation faced was using online communication. Because the only requirement of meeting our participants face to face was after the study (only if they opted for cash compensation), it was a potential that if we had met our participants and made a physical commitment, there would have been less drop-outs. Using email to communicate with our participants increased effectiveness and took away the hassle of having to meet in person at a specific date and time, however, it also required that our participants be diligent to checking their emails and replying on time.

Because our study was conducted using only post-secondary students, it is not representative of the overall population and therefore cannot be generalized to people who do not attend a post-secondary institution. The age of the majority of our participants were 21 and under, therefore we do not know if these effects carry onward to those older than this age range. Because those who attend university tend to be computer literate, we do not know if this program will be effective for those who do not use a computer on a regular basis.

Because this program was brief in duration and there is no point of contact planned for the future, we do not know if results will carry forward and be long lasting, or if the effects found will be short term. As this was a one time therapy, it is unknown if participants will use these techniques in the future or if they will be forgotten.

Conclusion

Although power was reduced and there were multiple limitations presented, the results of partial support for the effectiveness of this program support the continuance of testing this program again in the university sample, as well as in other populations. Mind-Op was found to decrease symptoms of depression, stress, and anxiety significantly in all experimental groups, where in the control groups there were no significant decreases in symptom experience. Self-Compassion was increased, which adds to the literature the effectiveness of this therapy.

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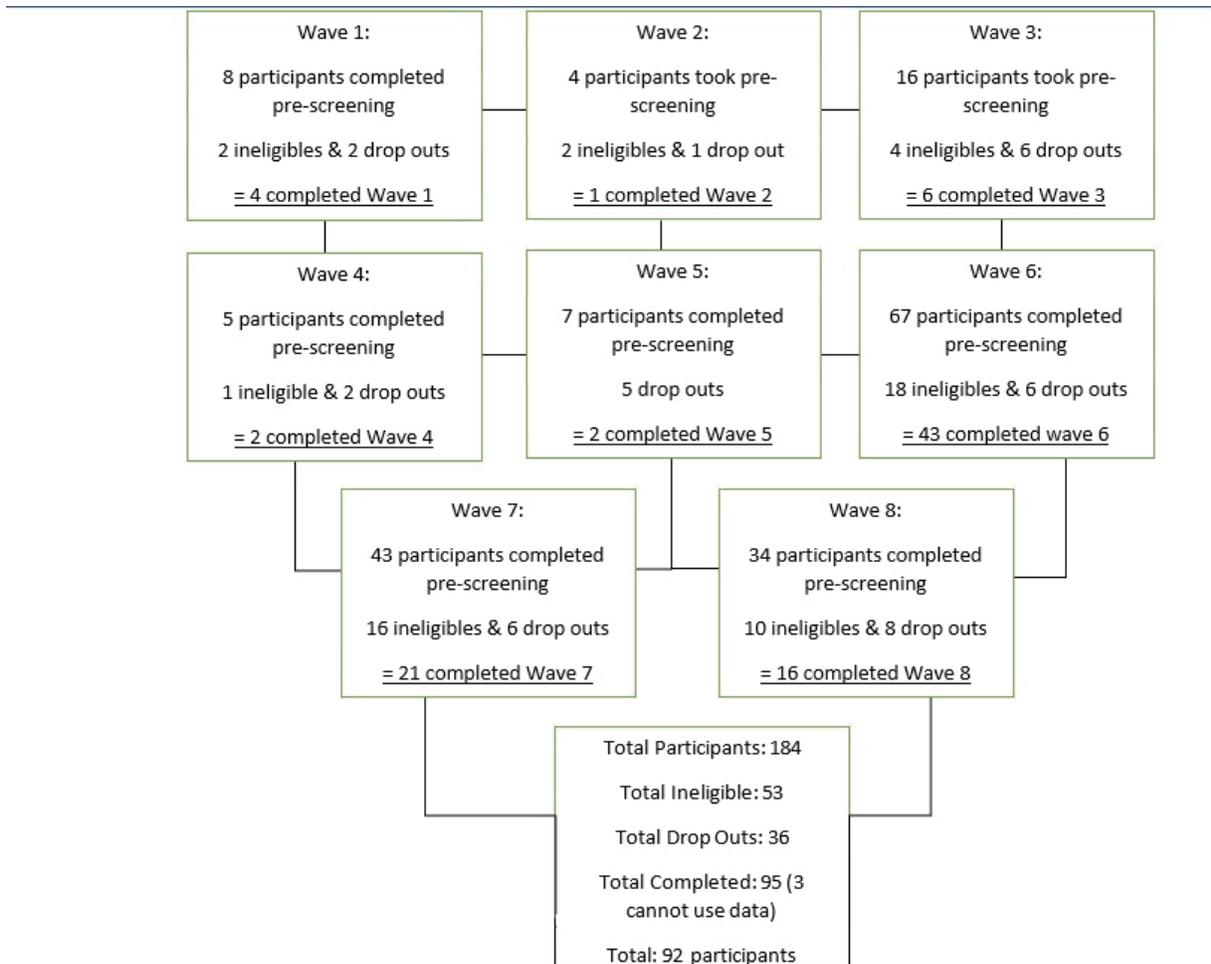
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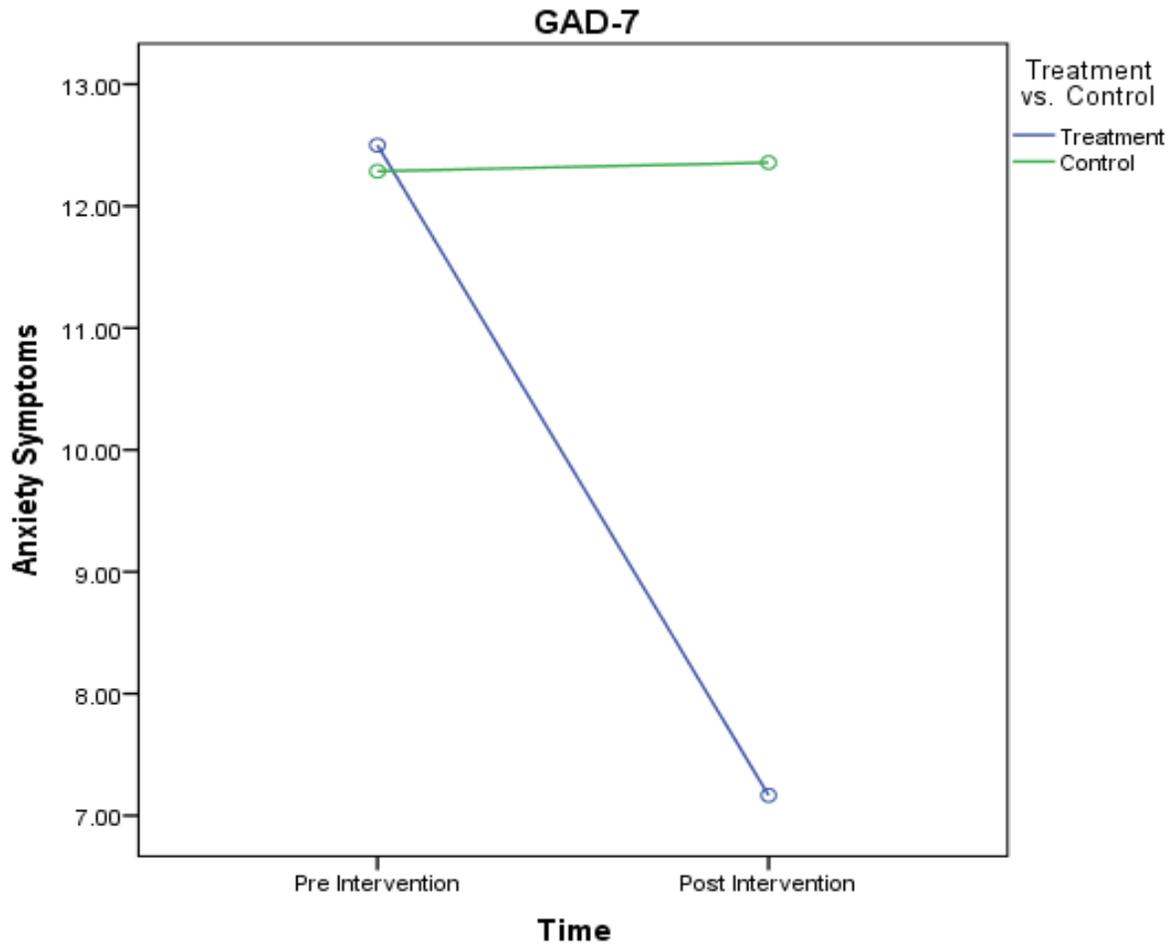
Appendix A: Table 1: Summary of Demographics

Table 1. Summary of Demographics	
	Participants
Gender	
Male	23
Female	69
Year of Degree	
1 st	21
2 nd	37
3 rd	21
4 th	9
5 th or higher	4
Age	
18	12
19	23
20	18
21	7
22	6
23	2
24	2
26	3
27	4
29	2
30 +	13

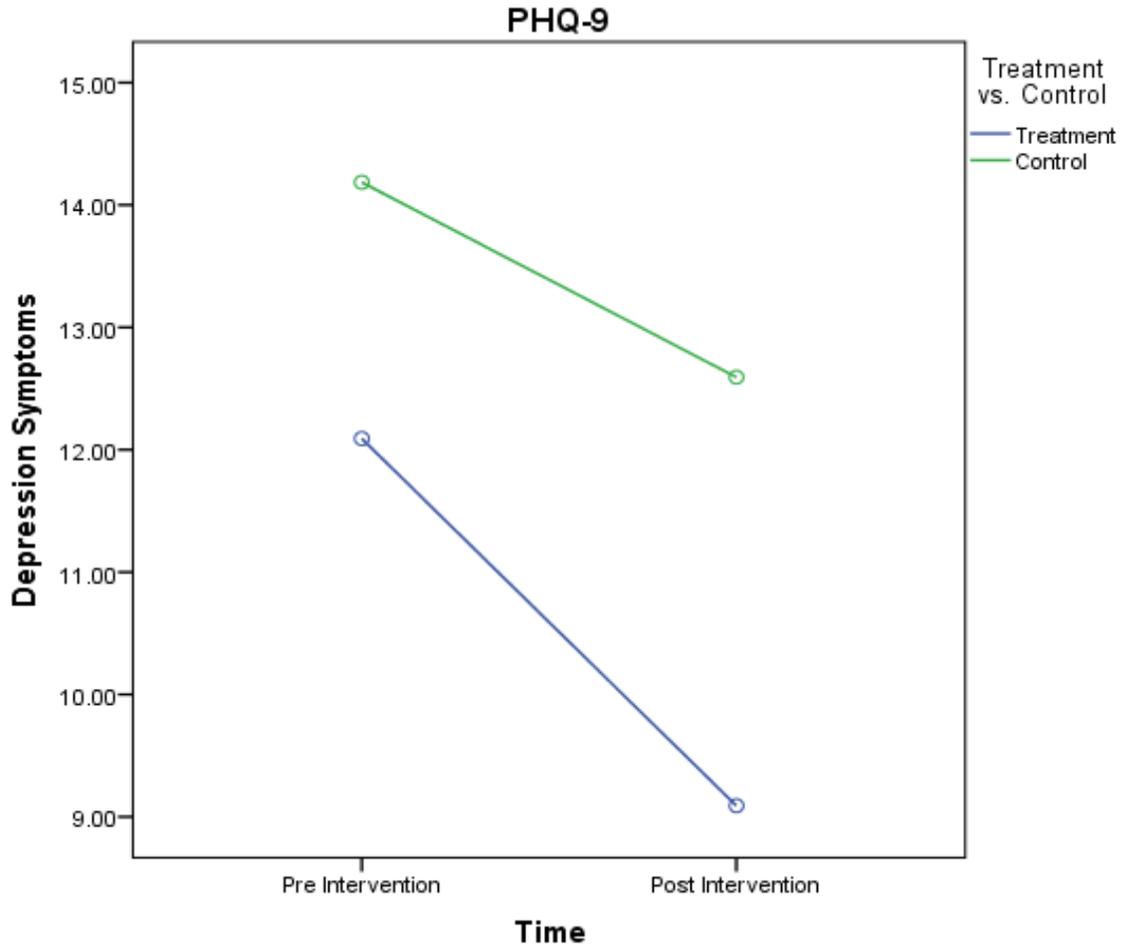
Appendix B – Participant Retention Flow Chart



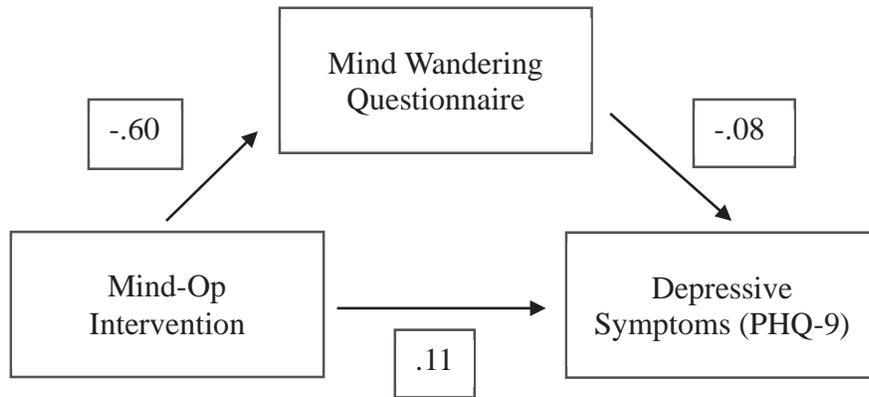
Appendix C – Anxiety Interaction



Appendix D: PHQ-9 Graph



Appendix E: Mediation Graph



Appendix F: Patient Health Questionnaire 9

PHQ-9

Instructions: Over the last 2 weeks, how often have you been bothered by any of the following problems?

	Not at all (0)	Several days (1)	More than half the days (2)	Nearly every day (3)
1. Little interest or pleasure in doing things.				
2. Feeling down, depressed, or hopeless.				
3. Trouble falling/staying asleep, sleeping too				
4. Feeling tired or having little energy.				
5. Poor appetite or overeating.				
6. Feeling bad about yourself, or that you are a failure, or have let yourself or your family down				
7. Trouble concentrating on things, such as reading the newspaper or watching TV.				
8. Moving or speaking so slowly that other people could have noticed. Or the opposite; being so fidgety or restless that you have been moving around more than usual.				
9. Thoughts that you would be better off dead or of hurting yourself in some way.				

B. If you checked off any problem on this questionnaire so far, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?

- Not difficult at all
- Somewhat difficult

- Very difficult
- Extremely difficult

Appendix G: Generalized Anxiety Disorder 7

GAD-7 Questionnaire

Instructions: Over the last 2 weeks, how often have you been bothered by any of the following problems? (Please tick the most appropriate box). The rating scale is as follows:.

0	1	2	3
Not at all	Several days	More than half the days	Nearly every day

Feeling nervous, anxious, or on edge				
Not being able to stop or control worrying				
Worrying too much about different things				
Having trouble relaxing				
Being so restless that it is hard to sit still				
Being easily annoyed or irritable				
Feeling afraid as if something awful might happen				

Appendix H: Perceived Stress Scale

For each question choose from the following alternatives:

0- Never 1- Almost never 2- Sometimes 3- Fairly often 4- Very often

_____ 1. In the last month, how often have you been upset because of something that happened unexpectedly?

_____ 2. In the last month, how often have you felt that you were unable to control the important things in your life?

_____ 3. In the last month, how often have you felt nervous and stressed?

_____ 4. In the last month, how often have you felt confident about your ability to handle your personal problems?

_____ 5. In the last month, how often have you felt that things were going your way?

_____ 6. In the last month, how often have you found that you could not cope with all the things that you had to do?

_____ 7. In the last month, how often have you been able to control irritations in your life?

_____ 8. In the last month, how often have you felt that you were on top of things?

_____ 9. In the last month, how often have you been angered because of things that happened that were outside of your control?

_____ 10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?

Appendix I: Self Compassion Scale

HOW I TYPICALLY ACT TOWARDS MYSELF IN DIFFICULT TIMES

Please read each statement carefully before answering. To the left of each item, indicate how often

you behave in the stated manner, using the following scale:

Almost never

Almost always

1

2

3

4

5

_____ 1. When I fail at something important to me I become consumed by feelings of inadequacy.

_____ 2. I try to be understanding and patient towards those aspects of my personality I don't like.

_____ 3. When something painful happens I try to take a balanced view of the situation.

_____ 4. When I'm feeling down, I tend to feel like most other people are probably happier than I am.

_____ 5. I try to see my failings as part of the human condition.

_____ 6. When I'm going through a very hard time, I give myself the caring and tenderness I need.

_____ 7. When something upsets me I try to keep my emotions in balance.

_____ 8. When I fail at something that's important to me, I tend to feel alone in my failure

_____ 9. When I'm feeling down I tend to obsess and fixate on everything that's wrong.

_____ 10. When I feel inadequate in some way, I try to remind myself that feelings of inadequacy are shared by most people.

_____ 11. I'm disapproving and judgmental about my own flaws and inadequacies.

_____ 12. I'm intolerant and impatient towards those aspects of my personality I don't like.

Appendix J: Five Facet Mindfulness Questionnaire

FFMQ-15: 15-item Five-Facet Mindfulness Questionnaire**Instructions**

Please use the 1 (never or very rarely true) to 5 (very often or always true) scale provided to indicate how true the below statements are of you. Circle the number in the box to the right of each statement which represents your own opinion of what is generally true for you. For example, if you think that a statement is often true of you, circle '4' and if you think a statement is sometimes true of you, circle '3'.

Never or very rarely true - 1
Rarely true - 2
Sometimes true - 3
Often true - 4
Very often or always true - 5

1. When I take a shower or a bath, I stay alert to the sensations of water on my body.
2. I'm good at finding words to describe my feelings.
3. I don't pay attention to what I'm doing because I'm daydreaming, worrying, or otherwise distracted.
4. I believe some of my thoughts are abnormal or bad and I shouldn't think that way.
5. When I have distressing thoughts or images, I "step back" and am aware of the thought or image without getting taken over by it.
6. I notice how foods and drinks affect my thoughts, bodily sensations, and emotions.
7. I have trouble thinking of the right words to express how I feel about things.
8. I do jobs or tasks automatically without being aware of what I'm doing.
9. I think some of my emotions are bad or inappropriate and I shouldn't feel them.
10. When I have distressing thoughts or images I am able just to notice them without reacting.
11. I pay attention to sensations, such as the wind in my hair or sun on my face.
12. Even when I'm feeling terribly upset I can find a way to put it into words.

13. I find myself doing things without paying attention.

14. I tell myself I shouldn't be feeling the way I'm feeling.

15. When I have distressing thoughts or images I just notice them and let them go.

Appendix K: Mind Wandering Questionnaire

1. I have difficulty maintaining focus on a simple or repetitive task

1-Almost never 2- very infrequently 3-somewhat infrequently 4-somewhat frequently 5-very frequently 6-almost
always

2. While reading, I find I haven't been thinking about the text and must therefore read it again

1-Almost never 2- very infrequently 3-somewhat infrequently 4-somewhat frequently 5-very frequently 6-almost
always

3. I do things without paying full attention

1-Almost never 2- very infrequently 3-somewhat infrequently 4-somewhat frequently 5-very frequently 6-almost
always

4. I find myself listening with one ear, thinking about something else at the same time

1-Almost never 2- very infrequently 3-somewhat infrequently 4-somewhat frequently 5-very frequently 6-almost
always

5. I mind wander during lectures or presentations

1-Almost never 2- very infrequently 3-somewhat infrequently 4-somewhat frequently 5-very frequently 6-almost
always