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Mindfulness and Covid-19 Stress Syndrome

An Exploratory Investigation into the Effects of Mindfulness Interventions on Covid-19 related Stress

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Abstract

The Covid-19 pandemic has led researchers to consider that what used to be considered phobia of a certain disease may actually be an adjustment disorder related to a specific psychosocial stressor, which is being referred to as Covid Stress Syndrome (Taylor, 2021).

This study aims to explore the impact of a brief mindfulness intervention on Covid-19 related stress, using the recently developed Covid Stress Scales (CSS; Taylor et al., 2020). Based on a literature review, it is hypothesized that state mindfulness reduces Covid-19 related stress.

The results of this study (N = 91) showed significant differences between the experimental group and the control group. However, contrary to the initial hypothesis, participants in the mindfulness group reported higher levels of covid stress than participants in the mind-wandering group.

Keywords: State mindfulness, Covid Stress Syndrome, meditation.

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Introduction

Given the current pandemic situation, many organizations were forced to switch to a remote work setting either partially or totally. A study done by Galanti, Guidetti, Mazzei, Zappalà & Toscano (2021) using the Job Demands-Resources (JD-R) model shows that certain job demands associated with working from home can reduce productivity, as well as work engagement.

Taking this into account, the levels of stress experienced by employees have most likely increased, not only because of the COVID-19 crisis but also because, while working from home new challenges have to be taken into account as job demands that mostly likely increase the levels of stress, such as difficulty to manage work-life balance and increased perception of social isolation (Galanti et al., 2021).

According to Dutton, Workman, and Hardin (2014), disruptive events may lead to feelings of distress, such as anxiety about the future, physical and/or emotional pain, feeling disconnected, financial concerns, and lack of job security. For this reason, in such times it is important to find strategies to help employees manage their suffering, in order to prevent the deterioration of their mental and physical health as well as their job performance overall (Dewe, O'Driscoll & Cooper, 2010).

Considering that many companies expect to continue using a remote work setting even after the pandemic, and that the work-home boundaries are increasingly "blurry", it is crucial to provide relevant information to the topic. Not only to reduce possible negative outcomes such as stress, burnout, and turnover but also to increase positive outcomes, especially work engagement and employee productivity (Nguyen & Le, 2021).

Literature Review

Mindfulness

Over the past years, mindfulness has become more popular, not only as an everyday practice that more and more people have incorporated into their routines but also, as a relevant research topic with recognized benefits.

Mindfulness is a Buddhist practice that encourages people to be entirely present in the current moment and avoid worrying about past and future situations (Althammer, Reis, van der Beek, Beck & Michel, 2021). Although it is a practice that is mostly associated with meditation, mindfulness goes way beyond that. It is a state that requires people to intentionally focus on the present moment as they experience it, in a non-judgmental manner (Shapiro, Carlson, Astin & Freedman, 2006).

Shapiro et al. (2006), established a model of mechanisms to explain the positive effects of mindfulness practice on well-being. According to this model, there are three necessary components to achieve mindfulness: (1) a specific goal (i.e., for self-regulation, or self-exploration); (2) intentional attention to the current moment free of judgment; and (3) paying attention with a kind, compassionate, patient and accepting attitude. Given the presence of these components, the authors believe that mindfulness will allow a shift in perspective which will contribute to other outcomes such as symptom reduction.

There are many ways to practice mindfulness, for example, everyday mindfulness requires people to intentionally remind themselves to pay more attention to the present moment throughout the day, whereas formal meditation practice involves including in one's routine a regular time to meditate (Siegel, Germer & Olendzki, 2009). Mindfulness requires a continuous commitment to its practice and cultivation in order to develop the skill (Kabat-Zinn, 2003).

Kabat-Zinn (2003) further clarifies that the word "practice" in this context refers to the engagement in the discipline as opposed to its common meaning of "rehearsal".

With its increasing popularity, the number of studies done concerning mindfulness-based interventions (MBIs) and their effectiveness as well as its benefits has also increased drastically with over 15000 published studies or dissertations on mindfulness (based on a Google Scholar search of entries with "mindfulness" in the title). Research suggests that mindfulness practice promotes awareness, reduces rumination, and increases attention which in turn increases the effectiveness of emotion-regulation strategies (Davis & Hayes, 2011).

Moreover, many studies have been done in several different areas about the impact of MBIs. Evidence suggests that MBIs can have a positive influence on mental and physical health, cognitive and affective factors, and relational outcomes. More specifically, when it comes to physical health studies show improvements in chronic pain management, immunity, and reduced symptoms and improved quality of life in stress-related conditions. Regarding mental health effects, evidence suggests a positive impact on the treatment of drug addiction, reduced anxiety, depression, and PTSD symptoms. Considering the cognitive and affective outcomes, MBIs can improve attention and working memory. Finally, in terms of interpersonal outcomes, initial studies suggest improvements in relationship satisfaction and prosocial behaviors (Creswell, 2017).

Covid Stress

With the worldwide spread of the Covid-19 virus (World Health Organization [WHO], 2020), there is an increasing apprehensiveness for the repercussions it may have on the mental health of the general population (Kazlauskas & Quero, 2020). Reports suggest that 25% of the

population experienced stress or anxiety-related symptoms at moderate to severe levels (Taylor, Landry, Paluszek, Fergus, McKay & Asmundson, 2020).

In previous widespread outbreaks of infectious diseases, such as the Spanish Flu, Avian Flu, or Ebola, there was also a fearful response and until recently, these fears were being described as mono-phobias. However, as researchers began to question this assumption, they found good reasons to suspect that these fears might be symptoms of a broader syndrome, which is being referred to as the "Covid Stress Syndrome" (Taylor, 2021), and to further explore and assess this Covid-19 related distress, Taylor et al. (2020) developed the Covid-19 Stress Scales (CSS). Moreover, these scales were initially created with the possibility of being adapted for future pandemics (Taylor et al., 2020).

According to Taylor (2021), this syndrome is an adjustment disorder that is considered a maladaptive reaction to a specific psychosocial stressor and it is characterized by the concern with the stressor's consequences or the stressor itself, including exaggerated worry, frequent and distressing thoughts related to the stressor, rumination, and unsuccessful adaptation to the stressor. Taylor et al. (2020) concluded that the Covid-19 related distress consists of five interconnected elements: (1) fear of getting infected or coming into contact with the coronavirus; (2) fear of socio-economic consequences; (3) fear of foreigners as they could be infected; (4) compulsive checking and need for reassurance related to the pandemic; and (5) traumatic stress symptoms related to the pandemic.

Mindfulness and Stress

Mindfulness helps individuals in dealing with potential stressors by encouraging self-regulation, values consolidation, and emotional, cognitive, and behavioral plasticity (Palmer & Rodger, 2009). By reducing emotional reactivity, there is also a reduction of the body's stress

response, leading to better physical and psychological outcomes (Bluth, Roberson, Billen & Sams, 2013). Due to the several potential benefits that have been theorized, the interest in mindfulness-based interventions has increased aggressively over the years.

One of the most prominent mindfulness interventions is the Mindfulness-Based Stress Reduction (MBSR) program, created by Jon Kabat-Zinn (Kabat-Zinn, 1982). Evidence shows that the MBSR has a positive psychosocial effect in several different problems, disorders, and populations, including cancer patients, chronic diseases, anxiety, depression, and stress (Baer, Carmody & Hunsinger, 2012). In a study conducted by Baer, Carmody, and Hunsinger (2012), the results suggest that those who participated in the MBSR program showed decreased levels of perceived stress as well as higher levels of mindfulness skills. In another study, using the same program, the participants experienced increased self-compassion, mindfulness, and spirituality, the ability to take things into perspective as well as reduced levels of perceived stress and mood disturbance (Birnie, Speca & Carlson, 2010).

Even though several studies show the benefits of mindfulness in dealing with stress, most of these studies include the 8-week MBSR program, which requires people to dedicate a lot of time to the practice of mindfulness. As such, the objective of this study is to analyze the impact of a brief and more informal mindfulness intervention on the Covid-19 related distress.

Hypothesis

This section aims to create a link between mindfulness and each of the five elements that make up the Covid-19 Stress, further developing the hypothesis of the present study.

H1: Brief mindfulness decreases Covid-19 danger and contamination fears.

Mindfulness, by promoting the acceptance of unpleasant thoughts and feelings, is associated with reduced psychological distress, especially during stressful occasions (Lindsay & Creswell, 2017). Previous studies show that mindfulness has a negative relationship with symptoms of distress, such as depression, anxiety, and stress during the pandemic (Vos, Habibovic, Nyklicek, Smeets & Mertens, 2021). Additionally, Vos et al. (2021) suggest that mindfulness and other positive traits may be protective factors when it comes to the aforementioned symptoms of distress that are associated with fear of Covid-19.

H2: Brief mindfulness decreases Covid-19 related fear of socio-economic consequences.

The Covid-19 pandemic had a great impact on the global economy, there have been declines in income, increased unemployment, and many industries have been affected by it (Mishra, Das, Yadav, Khan, Afzal, Alarifi, Kenawy, Ansari, Hasnain & Nayak, 2020). As such, it is understandable that most people have concerns when it comes to employment uncertainty which in turn leads to increased levels of work-related stress. In these cases, employees most likely find themselves worrying so much about the future that they fail to notice the present scenario. Mindfulness practice could be advantageous as it helps people focus on the present, decreasing the anticipation anxiety from focusing on the future (Jacobs & Blustein, 2008).

H3: Brief mindfulness decreases fear of foreigners as they could be infected.

With the outbreak of the coronavirus, many politicians deprecated foreigners as dangerous, especially the Chinese and Asian Americans by referring to the virus as the "Chinese virus" or the "Wuhan virus", which lead to an increase in xenophobic attitudes (Reny & Barreto, 2020). According to Thomas (2006), mindful people become more able to find new ways of

communicating more effectively and learn about different experiences and perspectives, in a multicultural context.

H4: Brief mindfulness decreases compulsive checking and reassurance seeking.

With compulsive checking and reassurance seeking individuals are searching for a sense of safety when they are feeling unsafe. Mindfulness may be helpful in dealing with these compulsions, allowing people to acknowledge the urge to check or seek reassurance, accepting it, and choosing to refrain from these compulsions (Hershfield & Corboy, 2020)**.**

H5: Brief mindfulness decreases Covid-19 traumatic stress symptoms.

There is an increasing number of studies dedicated to investigating the impact of MBIs in post-traumatic stress symptoms. However, there is some discord on whether mindfulness helps people in dealing with these symptoms or if exacerbates them (Banks, Newman & Saleem, 2015). Although there may be many possible benefits associated with mindfulness practice for people with post-traumatic stress disorder (PTSD), Lustyk et al. (2009) suggested that it may lead individuals to experience emotions and thoughts that have been avoided, being forced to deal with them in a possibly harmful way. To better understand the impact of MBIs in post-traumatic symptoms, Hopwood and Schutte (2017) conducted a meta-analytic investigation that found a significant effect of MBIs in reducing PTSD symptoms.

Method

Participants. Ninety-one students (N=91) from Nova SBE participated through the Nova Behavioral Lab in exchange for an additional 0.2 course credit. Participants were mostly Bachelor or Master students in the field of Management (N=90) (Table 1). There were only six participants who reported that they frequently (i.e., once or more than once a week) practice

yoga or meditation exercises. All ninety-one participants were included in the analyses (38.5% male, M_{age} = 22.20 years, *SD*=1.70, $range_{age}$ = 18-26) (see Appendix A).

Table 1

Demographics

	N	%
Gender		
Male	35	38.5%
Female	56	61.5%
Age	22.20 ± 1.70	
Field of Study		
Management	90	98.9%
Others	1	1.1%

Note. N and % stand for number of responses and percentages, respectively.

Inductions. Participants in the experimental group were asked to listen to a 15-minute mindfulness breathing meditation guided audio. The recording encouraged participants to focus on their breathing and its sensations while keeping an open mind to this experience. In case participants lost their focus, they were asked to be conscious of this without judgement but also to redirect their focus back to their breathing (N = 46).

Participants in the control group were asked to listen to a 15-minute mind-wandering guided audio. The recording instructed participants to think of whatever would come to their minds and just let their minds wander freely (N = 46).

Measures

State Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003). This scale is composed of 5 items and is meant to measure the levels of attention and awareness in

a given moment, in this case, right after the intervention. The items are rated on a 5-point Likert scale that goes from 0 “not at all” to 4 “extremely” (see Appendix B).

To measure the internal consistency of the scale a reliability analysis was done. The Cronbach’s Alpha for the SMAAS is 0.815 which is higher than the acceptable value (0.70), indicating a high level of internal consistency.

Toronto Mindfulness Scale (TMS; Lau, Bishop, Segal, Buis, Anderson, Carlson, Shapiro & Carmody, 2006). This is a self-report questionnaire with a total of 13 items and is composed of two factors, curiosity and decentering, and assesses state mindfulness in the moment (i.e., during or immediately after a meditation exercise) by asking participants to reflect on the meditation exercise and describe the experience on a 5-point Likert scale from 0 (“not at all”) to 4 (“very much”) (see Appendix C).

To measure the internal consistency of the scale a reliability analysis was done. The Cronbach’s Alpha for the TMS is 0.848 which is higher than the acceptable value (0.70), indicating a high level of internal consistency.

Covid Stress Scales (CSS; Taylor et al., 2020). These scales were recently developed in order to measure Covid-19 related stress. They are composed of a total of 36 items evenly divided by 5 subscales with the exception of the first subscale which has 12 items: danger and contamination fear; fear of socioeconomic consequences; xenophobia; compulsive checking and reassurance seeking and traumatic stress symptoms. The items are rated on a 5-point Likert scale that goes from 0 “not at all” to 4 “extremely” and the participants are asked to rate their level of worry related to certain aspects related to Covid-19 (see Appendix D).

To measure the internal consistency of the scale a reliability analysis was done. The Cronbach’s Alpha for the CSS is 0.912 which is higher than the acceptable value (0.70), indicating a high

level of internal consistency. Additionally, the same analysis was done for each dimension separately and the results showed an alpha coefficient above 0.70 for all of them.

Meditation Experience and Frequency. To make sure that the results wouldn't be compromised by participants with previous and regular experience with meditation, a few questions were included to assess the levels of experience and regularity with which participants practiced meditation before the experiment. The question "How often do you meditate through meditation exercises?" was used to assess meditation frequency, and participants answered in a scale from 1 "Never" to 7 "Daily". Most participants have never practiced meditation previously or do it very sporadically (i.e., 2-3 times a week or less) and only 6 participants do it frequently (Figure 1). The question "How much meditation training have you had (e.g., meditation exercises, meditation retreats)?" was used to measure previous experience, and participants answered in a scale from 1 "None" to 6 "Years". The majority of participants have none to very little previous experience with meditation (i.e., weeks or less) and only 4 participants have months or years of previous experience (Figure 2).

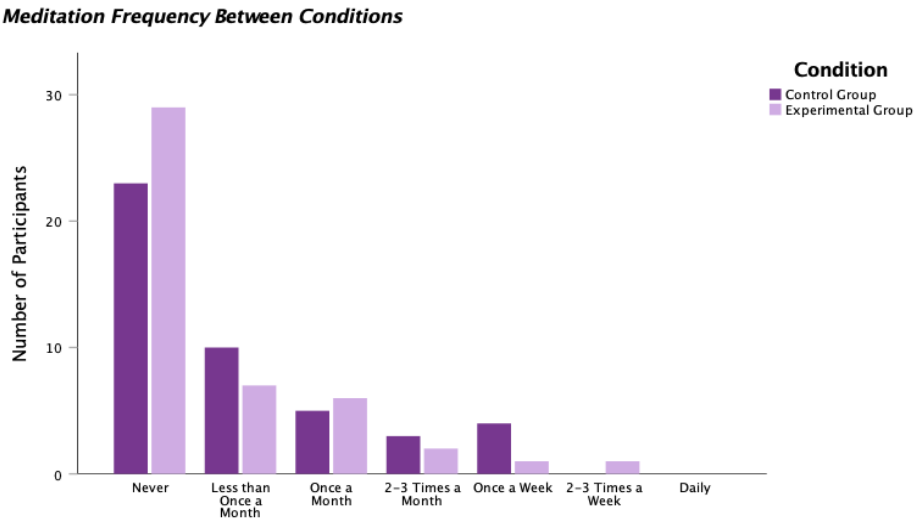

Figure 1. Frequencies of Meditation Exercises Between Conditions

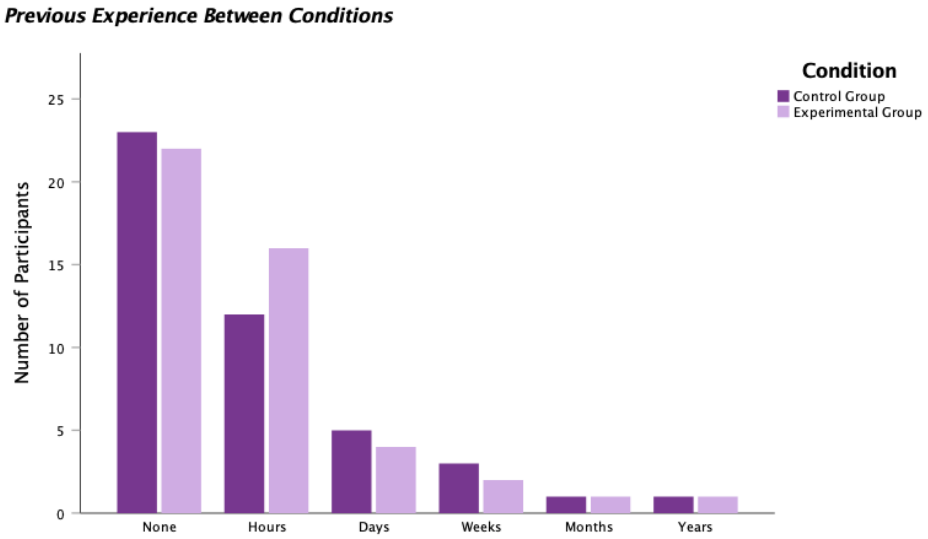

Figure 2. Length of Previous Experience Between Conditions

Procedures

Each lab session was conducted in groups of maximum 8 participants and had the duration of approximately 25 minutes. After participants arrived, they were all greeted and given the necessary instructions in order to successfully complete the survey. Each participant had access to an individual computer and their own set of headphones, they were all separated from each other by desk dividers.

The survey started by asking participants for their consent and they would only be able to continue if they agreed. After the informed consent, participants had an audio test to make sure the headphones were working. The experimental and control conditions were randomly assigned to the participants and after hearing the 15-minute audio designated to each condition, the participants were asked to answer to the TMS (Lau et al., 2006) and the state MAAS (Brown & Ryan, 2003) to measure mindfulness and the CSS (Taylor et al., 2020) to measure Covid-19 related stress. Additionally, participants were asked to answer a brief demographic

questionnaire and after the final question they would be redirect to another survey to keep track of the students who participated to gain extra credits.

Results

Manipulation Checks

The data was analyzed using SPSS version 28. To ensure that the intervention had a significant impact between groups, a Univariate Analysis of Variance (Univariate ANOVA) on state mindfulness was computed.

Participants in the experimental condition (M = 1.82, SD = 0.94) did not report significantly higher state mindfulness through the State MAAS when compared to participants in the control condition (M = 1.92, SD = 0.82, $p > .05$). However, the experimental group (M = 2.12, SD = 0.56) reported a significantly higher state mindfulness through the TMS when compared to the control group (M = 1.75, SD = 0.79, $p < .05$). Additionally, participants in the experimental condition (M = 2.28, SD = 0.76) reported higher levels of curiosity compared to participants in the control condition (M = 1.73, SD = 1.06, $p <.01$) but there were no significant changes in decentering between the experimental group (M = 1.97, SD = 0.57) and the control group (M = 1.76, SD = 0.75, $p >.05$).

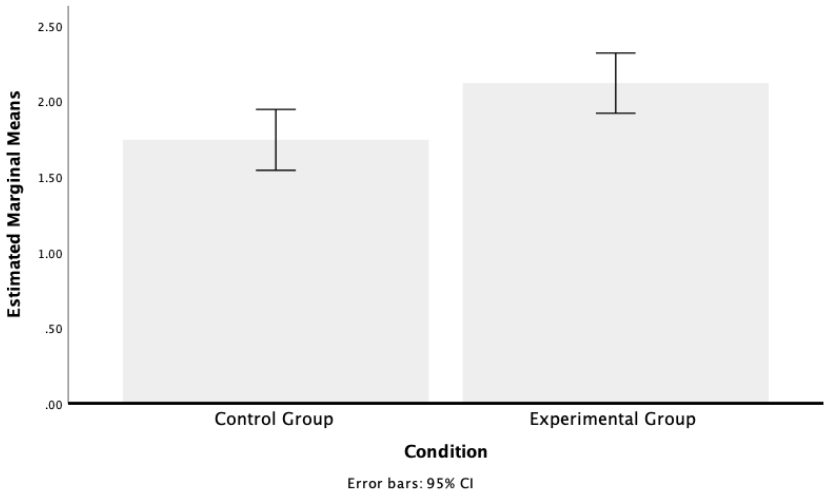

Figure 3. Estimated marginal means of state mindfulness overall through TMS.

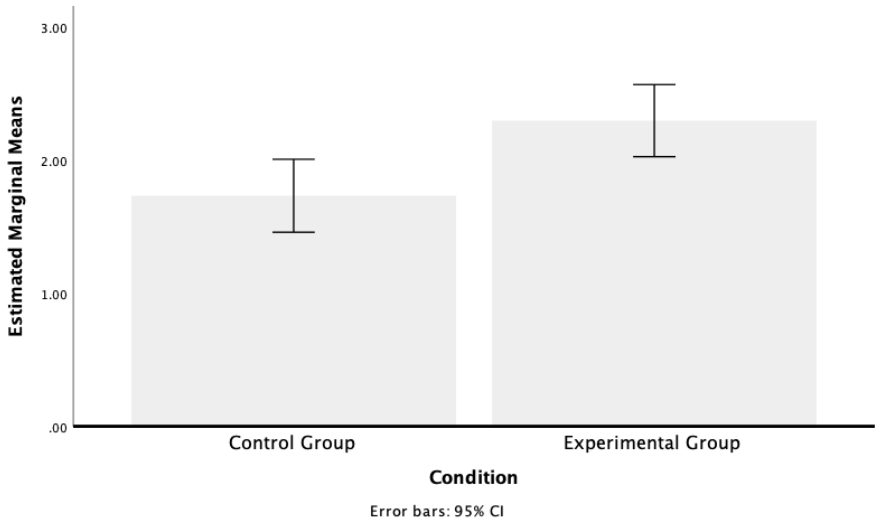

Figure 4. Estimated marginal means of state mindfulness overall through TMS.

Covid-19 Related Stress

A Univariate ANOVA was conducted for each dimension of the CSS in order to determine if the levels of Covid-19 related stress were significantly different across conditions.

Danger and contamination fears. The results show no significant differences between participants in the experimental condition (M = 1.28, SD = 0.75) and participants in the control condition (M = 1.01, SD = 0.64, p > .05).

Fear of socioeconomic consequences. The results show no significant differences between the experimental group (M = 0.56, SD = 0.87) and the control group (M = 0.43, SD = 0.69, p > .05).

Xenophobia. The results show no significant differences between participants in the experimental condition (M = 0.42, SD = 0.66) and participants in the control condition (M = 0.39, SD = 0.57, p > .05).

Compulsive checking and reassurance seeking. The results show a significant difference between the experimental group (M = 1.58, SD = 0.44) and the control group (M = 1.18, SD = 0.74, p = < .01). These results do not support the initial hypothesis since participants

in the control conditions reported lower levels of compulsive checking and reassurance seeking than participants in the experimental condition.

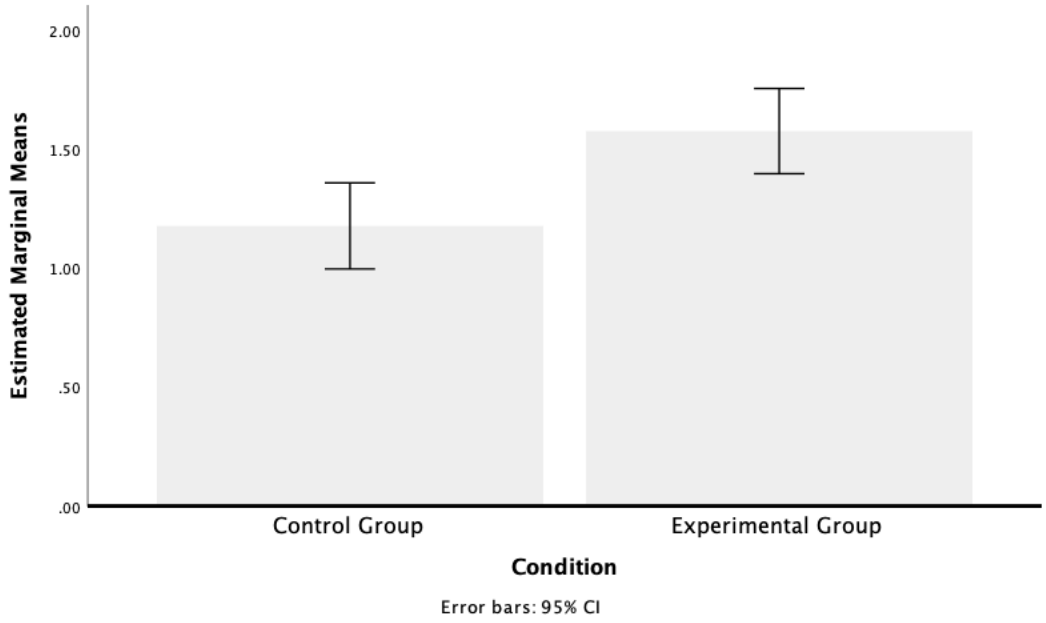

Figure 5. Estimated marginal means of compulsive checking and reassurance seeking.

Traumatic stress symptoms. The results show no significant differences between participants in the experimental condition (M = 0.22, SD = 0.45) and participants in the control condition (M = 0.21, SD = 0.32, p > .05).

Correlation Analysis

An additional Pearson Correlation Analysis was conducted in hopes of identifying possible relationships between the five dimensions of the CSS, the manipulation checks (TMS and SMAAS) as well as age, gender, previous experience, meditation frequency, condition, and finally, the five dimensions were averaged to analyze the overall Covid Stress. A significant positive relationship was found between the TMS and Covid Stress (Pearson's $r = 0.27$, $p < .01$), individually, only the danger and contamination fear dimension (Pearson's $r = 0.25$, $p < .05$) and the compulsive checking and reassurance seeking dimension (Pearson's $r = 0.43$, $p <$

.01), showed a significant positive relationship. There was also evidence of a positive relationship between the TMS and the meditation frequency (Pearson's $r = 0.23$, $p < .05$), which was expected (Table 2).

Table 2

Correlations Table

		Mean	SD	N	1	2	3	4	5	6	7	8	9	10	11	12	13
1	Condition	0,51	0,50	91	1,00												
2	Age	22,20	1,70	91	-0,40	1,00											
3	Gender	0,62	0,49	91	0,12	-0,54	1,00										
4	Previous Experience	1.74	1.09	91	-0.02	-0.07	0.34**	1,00									
5	Meditation Frequency	1.76	1.17	91	-0.1	0.05	0.22*	0.69**	1,00								
6	TMS	1,93	0,70	91	0,27*	-0,02	0,03	0.13	0.23*	1,00							
7	SMAAS	1,86	0,88	91	-0,06	0,01	-0,14	-0.17	0.00	-0,24*	1,00						
8	Danger and Contamination	1,45	0,97	91	0,19	-0,06	0,27*	0.23*	0.23*	0,25*	-0,09	1,00					
9	Traumatic	0,26	0,40	91	0,15	0,02	0,16	0.32**	0.16	0,12	-0,13	0,38**	1,00				
10	Xenophobia	0,41	0,62	91	0,03	0,09	0,12	0.07	0.07	-0,04	0,17	0,41**	0,29**	1,00			
11	Checking	1,38	0,64	91	0,31**	0,05	0,31**	0.09	0.05	0,43**	-0,15	0,35**	0,27**	0,25*	1,00		
12	Socioeconomic	0,50	0,78	91	0,08	-0,17	-0,07	-0.05	0.02	0,17	-0,08	0,34**	0,36**	0,41**	0,16	1,00	
13	Covid Stress	0,74	0,43	91	0,22*	-0,04	0,22*	0,16	0,15	0,29**	-0,08	-	-	-	-	-	1,00

**. P < .01 *. P < .05

a. Male = 1, Female = 0

Note. SD and N stands for standard deviation and number of responses, respectively.

Discussion

This study was meant to further examine the benefits of MBI's, more specifically on Covid-19 related stress. Initially, it was hypothesized that a brief mindfulness intervention would have positive effects on the five dimensions of Covid stress.

Two manipulation checks were conducted, the TMS and the SMAAS, to determine if the 15-minutes mindfulness audio had any effects on the participants in the experimental condition when compared to the 15-minutes mind-wandering audio that participants in the control condition had to listen. Only the TMS showed significant differences between the two conditions, revealing that the experimental group reported higher levels of state mindfulness

than the control group. According to Tanay and Bernstein (2013), the failed manipulation check through the SMAAS may be explained by some of the scale's limitations. In this case, the fact that this scale was design to measure state mindfulness in the context of daily activities, and not during or immediately after mindfulness practice. The authors further explain that this scale may not be a thorough measure of state mindfulness and may even lack content validity (Tanay & Bernstein, 2013).

When it comes to the correlation analysis, the results go against what was initially stated in the literature review, revealing a positive relationship between mindfulness and Covid-19 related stress, this means that an increase in state mindfulness would be accompanied by an increase in covid stress.

Considering the initial hypothesis 4, even though the results show that there was a significant difference between conditions, they show that the participants in the experimental group reported higher levels of compulsive checking and reassurance seeking than the participants in the control group. However, for the remaining dimensions of the CSS, the results showed no significant differences between the two conditions.

Since this study aims to analyze the relationship between mindfulness practice and Covid-19, which is a respiratory virus, a possible explanation for these results is the fact the chosen mindfulness intervention for this study was a breathing exercise. As such, by asking participants to focus on their breathing it is possible that they felt higher levels of anxiety than the participants who were asked to let their minds wander freely, allowing them to think of whatever came to their minds. Another possible explanation for these results is the context in which the intervention was conducted. Participants were in a closed room separated from each other by desk dividers and had their masks on. Ideally, this study should have been conducted in a more comfortable environment where participants could sit quietly with their masks off and relax while listening to the breathing exercise.

Another possible explanation is the fact that participants in the control group had to listen to a mind-wandering audio. Mind-wandering is mostly used as a control condition because it often disrupts performance on many activities and the negative effects of mind-wandering have been extensively studied in experimental settings (Mooneyham & Schooler, 2013). This type of self-generated thoughts can contribute to future unhappiness, disrupt certain goals, reduce external vigilance and can even influence the estimation of someone's intelligence (Smallwood & Andrews-Hanna, 2013). However, given that it is a reoccurring phenomenon, scholars began to question if it could have some benefits. Considering that mind-wandering usually involves focusing on our future or reflecting about our past, recent research shows that this type of thoughts is beneficial for creative thinking, consolidating memories and future thinking, characterized by patience instead of impulsivity (Smallwood & Andrews-Hanna, 2013). As such, if participants in the mind-wandering group were focusing on the future this could justify the results of this study, especially if the imagined scenarios were pleasant.

Finally, it should also be considered the possibility that the mindfulness induction did not work. Nonetheless, the results did show significant differences between conditions for the checking and reassurance seeking dimension, suggesting that the benefits of mind-wandering are a more logical explanation. Moreover, a study conducted by Zheng, Masters-Waage, Yao, Lu, Tan, and Narayanan (2020), over the period of 10 days showed that induced state mindfulness significantly reduces negative effects of Covid-19 stressors, specifically on sleep duration and work engagement.

Limitations and Future Research Suggestions

Even though both the experiment and the scales used for this study revealed high internal validity, there are a few limitations to consider for future research. The first and probably most relevant limitation to mention is the mindfulness intervention used. Considering

the results of this study it would be interesting to consider other forms of mindfulness induction such as body scan exercises.

Another limitation is the fact that all participants are students. Another study should be done with participants that had a more direct contact with Covid-19 and therefore were more affected by it, such as nurses and doctors for example. In a study conducted by Vitale (2021), using nurses that were working directly with Covid-19 patients, evidence shows that mindfulness interventions improve emotional regulation skills.

The context in which the experiment was conducted could also be considered a limitation of this study. For future research, participants should be in a more comforting environment, that allows them to relax and focus only on the meditation exercise.

Finally, it would be beneficial to try to replicate this study using a more long-term intervention, especially since the dimensions analyzed in this study are the result of a long-lasting pandemic.

Conclusion

Although the popularity of mindfulness practices and its inherent benefits has been increasing over time and the number of empirical research on the topic has increased along with it, there is still a lot left to explore, especially when it comes to arising topics such as the Covid Stress Syndrome.

This thesis contributes to the already existing literature when it comes to the use of brief mindfulness interventions and its relationship with Covid-19. Even though the results of this study contradict what was previously stated in the literature review, there are studies that show how mindfulness may be beneficial in stressful situation such as the pandemic. For example, evidence shows that mindfulness acted as a protective factor against the psychological distress linked to social distancing and quarantine, significantly reducing mental discomfort

(Conversano, Di Giuseppe, Miccoli, Ciacchini, Gemignani & Orrù, 2020). Furthermore, another study found that mindfulness significantly improves psychological well-being, anxiety, depression, and emotional exhaustion, among others (Matiz, Fabbro, Paschetto, Cantone, Paolone & Crescentini, 2020). As such, more research on this topic should be conducted to fully understand the extent to which brief mindfulness interventions may be beneficial.

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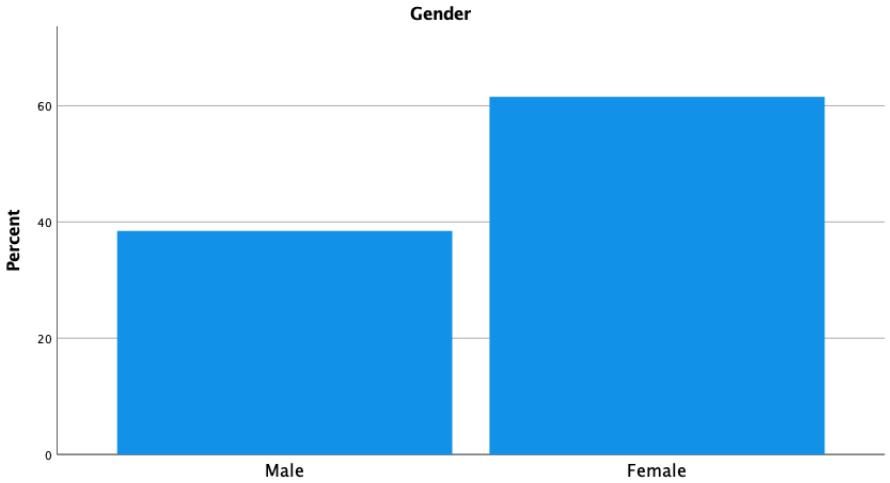
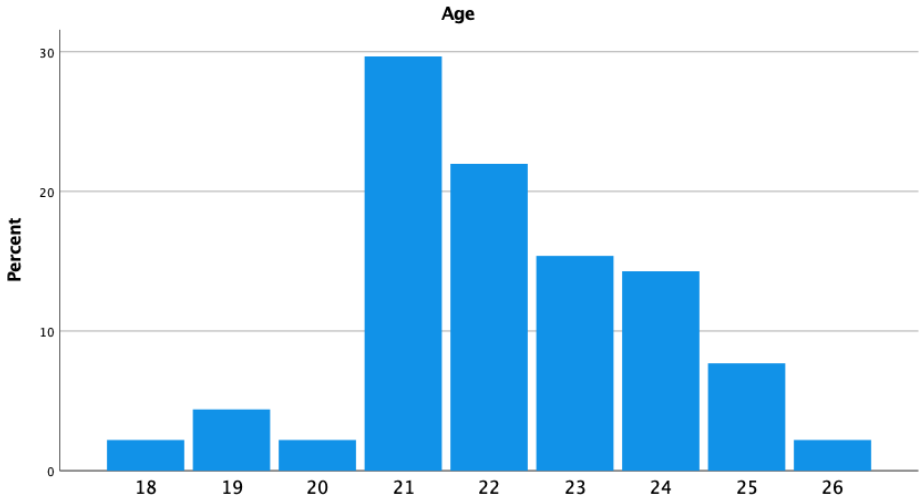
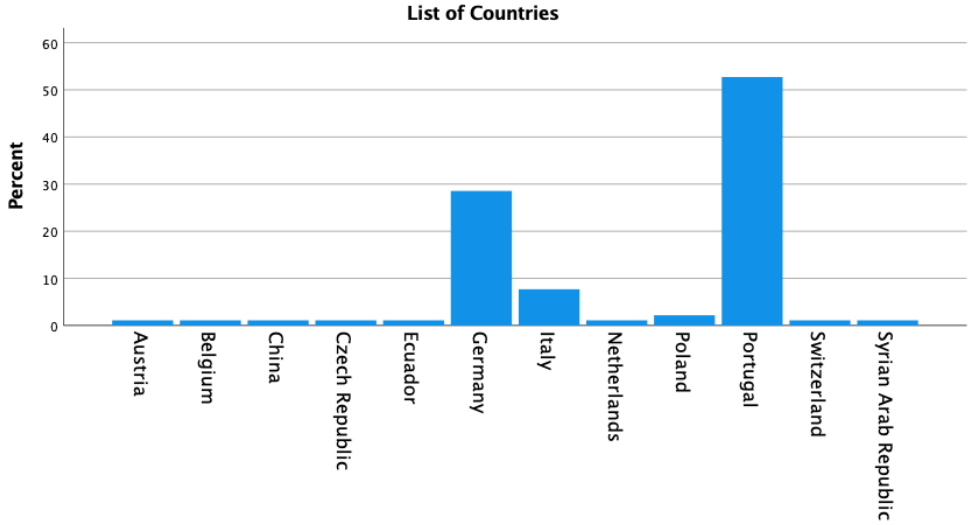
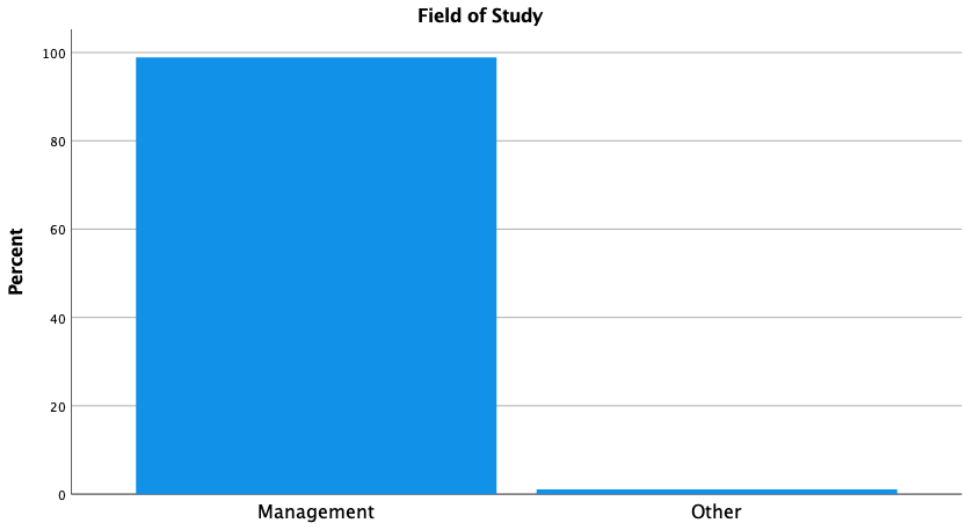
Appendixes

Appendix A – Demographics









Appendix B – StateMAAS

The following are some statements that describe how you feel right now.

Please indicate the extent to which you feel this way with the scale provided (e.g. not at all, extremely, etc).
Although some of the statements seem repetitive, please try your best to answer them.

Right now,
1. I find it **difficult to stay focused** on what's happening in the present.
2. It seems that **I am "running on automatic"** without much awareness of what I'm doing.
3. I feel like I **am rushing through things** without being really attentive to them.
4. I am doing **things automatically** without being aware of what I was doing.
5. I am **preoccupied with the future or the past.**

Scale Points:

0. Not at all; 1. A little; 2. Moderately; 3. Quite a bit; 4. Extremely

Appendix C – Toronto Mindfulness Scale

The following are some statements that describe **<u>what you just experienced</u>**. Below is a list of things that people sometimes experience.

Please indicate the extent to which you agree with each statement.
In other words, how well does the statement describe what you just experienced, just now?

1. I experienced myself as separate from my changing thoughts and feelings
2. I was more concerned with being open to my experiences than controlling or changing them
3. I was curious about what I might learn about myself by taking notice of how I react to certain thoughts, feelings or sensations
4. I experienced my thoughts more as events in my mind than as a necessarily accurate reflection of the way things 'really' are.
5. I was curious to see what my mind was up to from moment to moment.
6. I was curious about each of the thoughts and feelings that I was having.
7. I was receptive to observing unpleasant thoughts and feelings without interfering with them.
8. I was more invested in just watching my experiences as they arose,than in figuring out what they could mean.
9. I approached each experience by trying to accept it, no matter whether it was pleasant or unpleasant.
10. I remained curious about the nature of each experience as it arose.
11. I was aware of my thoughts and feelings without overidentifying with them.
12. I was curious about my reactions to things.
13. I was curious about what I might learn about myself by just taking notice of what my attention gets drawn to

Scale Points:

1. Not at all; 1. A little; 2. Moderately; 3. Quite a bit; 4. Very much

Appendix D – Covid Stress Scales

<u>Danger</u>
The following asks about various kinds of worries you might feel right now. In the following statements, we refer to COVID-19 as "the virus".

1. I am worried about catching the virus
2. I am worried that basic hygiene (e.g., handwashing) is not enough to keep me safe from the virus
3. I am worried that our healthcare system is unable to keep me safe from the virus
4. I am worried that I can't keep my family safe from the virus
5. I am worried that our healthcare system won't be able to protect my loved ones
6. I am worried that social distancing is not enough to keep me safe from the virus

Scale Points:
0. Not at all; 1. Slightly; 2. Moderately; 3. Very; 4. Extremely

Socio-economic consequences

The following asks about various kinds of worries that you might feel right now. In the following statements, we refer to COVID-19 as "the virus".

1. I am worried about grocery stores running out of food
2. I am worried about grocery stores running out of cold or flu remedies
3. I am worried about pharmacies running out of prescription medicines
4. I am worried about grocery stores running out of water
5. I am worried about grocery stores running out of cleaning or disinfectant supplies
6. I am worried that grocery stores will close down

Scale Points:
0. Not at all; 1. Slightly; 2. Moderately; 3. Very; 4. Extremely

Xenophobia

The following asks about various kinds of worries that you might feel right now. In the following statements, we refer to COVID-19 as "the virus".

1. I am worried that foreigners are spreading the virus in my country
2. If I met a person from a foreign country, I'd be worried that they might have the virus
3. I am worried about coming into contact with foreigners because they might have the virus
4. I am worried that foreigners are spreading the virus because they're not as clean as we are
5. If I went to a restaurant that specialized in foreign foods, I'd be worried about catching the virus
6. If I was in an elevator with a group of foreigners, I'd be worried that they're infected with the virus

Scale Points:
0. Not at all; 1. Slightly; 2. Moderately; 3. Very; 4. Extremely

Contamination

The following asks about various kinds of worries that you might feel right now. In the following statements, we refer to COVID-19 as "the virus".

1. I am worried that people around me will infect me with the virus
2. I am worried that if I touched something in a public space (e.g., handrail, door handle), I would catch the virus
3. I am worried that if someone coughed or sneezed near me, I would catch the virus
4. I am worried that I might catch the virus from handling money or using a debit machine
5. I am worried about taking change in cash transactions
6. I am worried that my mail has been contaminated by mail handlers

Scale Points:
0. Not at all; 1. Slightly; 2. Moderately; 3. Very; 4. Extremely

Traumatic

In the following statements, we refer to COVID-19 as "the virus". Please read each statement and indicate how frequent each problem has been for you.

1. I had trouble sleeping because I worried about the virus
2. I had bad dreams about the virus
3. I thought about the virus when I didn't mean to
4. Disturbing mental images about the virus popped into my mind against my will
5. I had trouble concentrating because I kept thinking about the virus
6. Reminders of the virus caused me to have physical reactions, such as sweating or a pounding heart

Scale Points:

0. Never; 1. Rarely; 2. Sometimes; 3. Often; 4. Almost Always

Checking

How much have you checked the following because of concerns about COVID-19?

1. Social media posts concerning COVID-19
2. YouTube videos about COVID-19
3. Seeking reassurance from friends or family about COVID-19
4. Checking your own body for signs of infection (e.g., taking your temperature)
5. Asking health professionals (e.g., doctors or pharmacists) for advice about COVID-19
6. Searched the Internet for treatments for COVID-19

Scale Points:

0. Never; 1. Rarely; 2. Sometimes; 3. Often; 4. Almost Always

Appendix H – Demographic Questions

This and the following page are the final section of the survey. Please fill out the following demographic questions.

Gender

1. Male
2. Female

Age

▼ 16 (1) ... 80 (65)

What is your nationality?

▼ Afghanistan (1) ... Zimbabwe (1357)

Meditation Frequency

How often do you meditate through meditation exercises?
How often do you do yoga?

1. Never; 2. Less than Once a Month; 3. Once a Month; 4. 2-3 Times a Month; 5. Once a Week; 6. 2-3 Times a Week; 7. Daily

Meditation Experience
How much meditation training have you had (e.g. meditation exercises, meditation retreats)?
How much yoga training have you had?

1. None; 2. Hours; 3. Days; 4. Weeks; 5. Months; 6. Years

Do you have asthma or any other condition which affects your breathing?
1. No; 2. Yes, I have asthma; 3. Yes, I have... (please type condition)

Were there any issues with the recording or other aspects of the survey?
1. No; 2. Yes (please briefly explain); 3. There was no page with a recording

How easy was it for you to follow the audio guided task?
1. Very easy; 2. Easy; 3. Difficult; 4. Very difficult

What is your field of study/work?
1. Finance; 2. Economics; 3. Management; 4. Other

Appendix I – Consent and Debrief

Consent

Title of Research Study: Study for Master Thesis of Carlota Salema
Principle Investigators: Professor Samantha Sim, Carlota Salema

Purpose of Research Study: The purpose of conducting this research study is to understand the relationship between mental tasks and Covid-19 related distress.

Study Procedures and Duration: To participate in the study, you must be above 18. For this study, you will first complete a 15 minute audio-guided mental task, then complete short surveys and complete some demographic questions. The experiment takes no more than 25 minutes.

Benefits of Study: You will receive 0.2 class credit for having signed up on Moodle and successfully completing this study. Your participation in this study is voluntary, your refusal to participate or your withdrawal from this study will involve no penalty and you may discontinue participation at any time.

PLEASE NOTE:
It would really help us if you complete the survey by giving your fullest attention, reading all instructions and statements carefully and then responding accordingly to all the items. This helps us get an accurate picture of your experience.

Possible Risks of Study: There are no anticipated risks or adverse effects in this study beyond what one would typically experience in daily life.

Confidentiality and Privacy of Research Data: The information provided by all respondents will be anonymous and confidential and will be used for research purposes only. The survey responses contain no identifying information. Also, no one will have access to your completed survey except for the Principal Investigators (PI) and the research team. As such, please answer all questions as honestly and accurately as possible.

Please select "I consent" and click ">>" to begin.
If you do not wish to participate in the survey, you may close the browser now to exit.

Debrief

The rest of this page is a debrief form with information about this study if you are interested in know more.

Please do not discuss any details about the study you just completed with your colleagues, as we are still collecting data. Your discussion could contaminate the results of our study. If you are asked about the study, please tell your colleagues that it was interesting and that they should participate, signing up via Moodle!

Remember to submit your answers at the end of this page.

Explanation of the general research field of study:
This research is about mindfulness meditation and its relationship with Covid-19 related stress.
In this study, you listened to a mindfulness induction audio or to a mind-wandering induction audio. After the audio, everyone had to report how mindful they were, emotions they felt, and completed the Covid-19 Stress Scales (CSS).
It is hypothesised that mindfulness practice will have a significant impact on Covid-19 related distress symptoms. Your participation helps us collect data to determine whether this might or might not be the case.