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THE IMPACT OF BRIEF ELECTRONIC GUIDED MINDFULNESS MEDITATION ON ANXIETY SCORES

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THE IMPACT OF BRIEF ELECTRONIC GUIDED MINDFULNESS MEDITATION ON ANXIETY SCORES

By

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THE IMPACT OF BRIEF ELECTRONIC GUIDED MINDFULNESS MEDITATION ON ANXIETY SCORES

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ABSTRACT

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By

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In the United States, anxiety rates are on the rise for the general population (Goodwin et al., 2020a). Prolonged and frequent anxiety can become unprompted and problematic (American Psychiatric Association, 2021). Management of anxiety is crucial for overall wellbeing. Access to treatment and resources for anxiety may be limited in rural geographical locations (Morales et al., n.d.). This DNP project sought to determine whether a brief intervention of electronic guided mindfulness meditation (MM) by Insight Timer is effective in decreasing anxiety in a rural populous. Convenience sampling recruited a final total of 11 rural participants who participated in seven sessions of mindfulness meditation over a 14-day period. Analysis via permutation testing of Zung Self-Rating Anxiety Scale scores from pre/post scores showed the intervention of MM to be statistically significant ($p=0.0015$).

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Introduction

Anxiety is a typical physiological stress response that everybody experiences to some degree in their lifetime. The response can further be described as an emotion characterized by feelings of fear, worrisome thoughts, and generalized tension (American Psychological Association, 2022). The 'fear' an individual with anxiety experiences is an autonomic state of alarm characterized by a 'fight or flight' response to a perceived or real danger (Chand & Marwaha, 2023). Anxiety is "linked to fear and manifests as a future-oriented mood state that consists of a complex cognitive, affective, physiological, and behavioral response system (Chand & Marwaha, 2023, para. 2)".

Objective changes seen with anxiety within the body include increased blood pressure and heart rate. In addition to increased cardiac output, amplified cortisol (a stress hormone) and hydrochloric acid secretion are also noted (American Psychological Association, 2022). Causes of anxiety are individualized and caused by various biopsychosocial factors including, but not limited to genetic vulnerability (Chand & Marwaha, 2023). Acute or situational anxiety may be experienced when starting a new job, preparing to take an important exam, or being chased by a wild animal. The response of anxiety can be beneficial in alerting us to danger by aiding us to focus our attention when it is needed. Anxiety prepares our body to "fight or flight" with the sense of endangerment. However, when dealing with prolonged stressful events or traumatic experiences, chronic anxiety can occur, leading to a state of disorder or dysfunction.

The amygdala and limbic system work together to mitigate fear and anxiety within the sympathetic nervous system. This is an autonomic function involving chemical neurotransmitters such as serotonin, dopamine, norepinephrine, and gamma-aminobutyric acid (GABA) (Chand & Marwaha, 2023). These chemical mediators found in our body are responsible for various physiological responses including dilating our pupils, increasing our respirations, getting our blood pumping quickly, and triggering our bodies to react rapidly (National Institute of Mental Health, 2023). These physiological responses may be necessary when protecting us from danger, however, problems can occur when anxiety becomes consistently present, or present in unnecessary situations.

Prolonged and frequent anxiety can become unprompted and problematic, conceivably becoming what is known as an anxiety disorder (American Psychiatric Association, 2021). "People with anxiety disorders usually have recurring intrusive thoughts or concerns. They may avoid certain situations out of worry. They may also have bothersome physical symptoms such as sweating, trembling, dizziness or a rapid heartbeat (American Psychological Association, 2022, para. 1) ." Anxiety and anxiety disorders alike can be troublesome to individuals who experience them, and persistent anxiety can lead to additional illnesses contributing to a decreased quality of life (H. Song et al., 2018).

Prolonged stress and anxiety are the two most common risk factors when discussing the development of mental illness (Anxiety and Depression Association of America, 2019). Anxious temperament and subclinical anxiety earlier in life are associated with an increased risk of subsequent onset of anxiety disorders, depression,

substance use disorders, and concerning chronic health complications such as heart disease, obesity, and diabetes mellitus (Goodwin et al., 2020a).

In the United States, anxiety rates are on the rise for the general population and have increased most rapidly among young adults (Goodwin et al., 2020a). From January 20, 2021–February 1, 2021, more than two in five adults aged ≥18 years experienced symptoms of an anxiety disorder during the past seven days (CDC, 2021). Stratification by age during this period revealed the most notable increase among participants 18–25 years old ($p < 0.001$), which was a more rapid increase than among 26–34 and 35–49-year-olds ($p < 0.001$) (Goodwin et al., 2020a).

According to Morales et al. (2020), the widespread increase in mental illness and anxiety is multifactorial, and is seen across all socioeconomic backgrounds, genders, and races. Anxiety disorders co-occur with other mental illnesses. We see higher rates of depression and anxiety in rural areas in comparison to urban regions. Approximately one-fifth of the US population live in a rural area, and about one-fifth of those living in rural areas, or about 6.5 million individuals, have a mental illness (Morales et al., n.d.).

Current medical guidelines provide direction for treatment of anxiety with a focus on psychotherapy in addition to pharmacological options (UpToDate, 2023). Access to these first line recommendations varies depending on numerous factors, such as economic status, access to healthcare and geographical location (Morales et al., 2020a).

According to Mental Health America (2018), mental health services in the U.S. are insufficient despite more than half of Americans (approximately 56%) needing and

seeking help. In rural areas it is estimated that up to "65% of nonmetropolitan counties do not have psychiatrists, and over 60% of rural Americans live in designated mental health provider shortage areas (Morales et al., 2020b)." With a disturbing lack of mental health resources, particularly in rural areas, achievable interventions to promote mental health are imperative now more than ever. In the past decade, there has been a considerable increase of interest in holistic approaches for the reduction of anxiety (K. Song et al., 2022). Despite this shift, there still is a demand for research concentrated on discovering attainable non-pharmacologic interventions for anxiety in individuals living in rural areas.

Background and Significance

An easily attainable intervention to reduce anxiety in rural populations is necessary. Mindfulness meditation (MM) provides an adjunctive therapy option for overall mental health promotion and anxiety management and treatment. The process known as mindfulness meditation (MM) can be described as practicing a psychological state of awareness of oneself.

Literature suggests that MM enhances attention, working memory, emotional regulation, and reduces rumination (Davis & Hayes, 2012). Practices of mindfulness meditation (MM) are proven to decrease stress and anxiety in the general population (Economides, Martman, Bell, & Sanderson, 2018). The practice of MM is known to help alleviate stress responses and even alter the size of brain structures after just eight weeks of regular meditation (Lazar et al., 2005). Furthermore, mindfulness meditation demonstrates several positive academic benefits, such as reducing test anxiety and improving the grade point averages of students whom participate (Foley & Lanzillotta-Rangeley, 2021).

Practicing MM by oneself can be difficult without formal training. Technology-guided programs have come into popularity due to the ease of access and guided direction. As of late, the increase in research to the evidence-based phenomena is growing regarding technology-guided MM.

Insight Timer is one of the many technology-based programs that deliver guided MM sessions through their mobile application or website. Research has shown that the use of electronic guided MM programs is effective in decreasing stress and anxiety in its

users (Spijkerman et al., 2016). An additional electronic guided MM program, Headspace, reports "numerous studies have shown that meditation is an effective stress-management tool, ultimately reprogramming the brain to the extent that meditators end up with more capacity to manage stress when meditation is a consistent, daily practice (Headspace Staff, n.d., para. 2)."

Insight Timer and other platforms of guided MM have been newly researched within the United States. In a study conducted within a university anesthesia program, in 71 students, researchers found that in the category of anxiety, a 32% reduction was seen with the use of the Headspace application (Foley & Lanzillotta-Rangeley, 2021). Significant decreases in depression, anxiety, and stress were all observed in student registered nurse anesthetists after a 10-day intervention period of MM.

Meta analysis suggests the effect of mindfulness-based therapy on anxiety is significant and promising intervention for treating anxiety and mood problems in clinical populations (K. Song et al., 2022). In the United States, approximately 85% of American adults use a smartphone device (Langford et al., 2019). Utilizing health applications can be an extremely beneficial tool to reach individuals. The effectiveness of brief intervention of electronic guided MM can further contribute to the evolution of mental health services within rural populations, where access to other treatment methods may be limited.

Purpose of the DNP Project

The purpose of this prospective, quasi-experimental DNP project is to determine whether a brief intervention of mindfulness meditation (MM) practice guided by technology via Insight Timer is significantly effective in decreasing anxiety scores among rural participants. While it is studied and well-documented that meditation over several weeks is successful in reducing anxiety, there have been limited research projects on the benefits of meditation over a short period in rural populous. Sessions of guided MM ranging from seven to 12 minutes will be offered to those participating in the project. If the DNP project null hypothesis is rejected, findings could be used for support of additional options for anxiety treatment plans as well as provide an accessible intervention for rural residents, where there is potential for limited resources.

This DNP project aims to assess a potentially beneficial, easily accessed, non-pharmacological approach to anxiety reduction that is safe. The DNP project alternative hypothesis postures that a brief intervention of technology-guided MM by Insight Timer is effective in decreasing anxiety in a rural populous. The goal is to determine whether the incorporation of an easily accessed evidence-based mindfulness-based program is successful in contributing to a greater sense of general wellbeing via anxiety score reduction. Successfully rejecting the null hypothesis of this study will contribute to enhanced body of knowledge regarding the safe and effective practice of electronic application-guided MM.

Methods

The sample of participants includes individuals over the age of 18 living in a rural demographic location. Participants were recruited for the project via self-enrolled convenience sampling (flyers with QR code entry, social media advertisement, and word of mouth recruitment). The organizational design of the project is Quasi-experimental. The instruments used for data collection include electronic pre and post questionnaires that included instructions to complete the Zung Self-Rated Anxiety Scale (SAS) in addition to collection of basic participant demographic information.

The intervention consisted of completion of seven free mobile application MM sessions guided by the Insight Timer electronic application ranging from seven-12 minutes in length. Participants had two calendar weeks (14 days) to complete seven sessions. Individuals were instructed to use any mobile device with capability to support the Insight Timer application. Mindfulness meditation courses were to be completed at the participant's leisure, with their choice of device.

For statistical analysis, all ordinal data used for the project are collected via Qualtrics and imported into Microsoft Excel. Extracted data are then analyzed by a trusted statistician using tailored software to test for intervention significance. Participant data are to be kept confidential and stored within a locked electronic file on the researcher's and statistician's personal computers. All participant personal data will continue to be protected and is to be destroyed within six years of collection.

Theoretical Framework

The theoretical basis for the DNP project is based on the stress, coping, and adaptation theory by Lazarus. This theory focuses on psychological responses and coping with stressful situations (McEwen & Wills, 2019). Lazarus provides a process-oriented approach directed toward what an individual thinks and does within the context of an encounter. As the process unveils, thoughts and actions change depending on how the individual copes with that particular situation (McEwen & Wills, 2019). The theory includes how these thoughts and actions change as the encounter unfolds, dependent on how that individual copes (Biggs et al., 2017).

With guided MM by Insight Timer, individuals are directed to heighten their self-awareness, thoughts, and emotions. By participating in MM programs, users are prompted to experience an alternative coping mechanism to aid with concerning negative thoughts and emotions generating potential internal anxiety. Through development of a productive coping strategy via the mechanism of MM, it is theorized that one can apply said mindful techniques for adaptation of stress and anxiety responses.

Chapter Two

Introduction

It has been recognized that mindfulness meditation (MM) is a safe, accessible, and effective practice related to the treatment and management of stress and anxiety (Astin, 1997). The current literature provides beneficial evidence related to the anti-anxiety effects of technology-guided MM with a generalized healthy population. Technology-based mindfulness meditation programs are the most accessible ways to practice MM effectively and are associated with significant stress and anxiety reduction (E. Yang et al., 2018). There is existing evidence-based research that indicates that internet-based MM applications effectively aid in managing stress and anxiety in the general population (Economides et al., 2018).

Mindfulness meditation is an effective way to relieve tension and anxiety. As stated by MM application Headspace researchers , "we meditate to counter the "stress response" with the "relaxation response," leading to a decrease in blood pressure, heart rate, and oxygen consumption," which all have their benefits to improving physiological and psychological health (Headspace Staff, n.d., para. 14). The practice of MM is even noted to have positive gradual structural brain changes that in areas that affect emotional regulation (Headspace Staff, n.d.). The present literature provides beneficial evidence related to the anti-anxiety effects of technology-guided MM with a generalized healthy population.

Literature Review

There have been prominent structural changes seen in the brain that suggest that MM may be beneficial for mental wellbeing. In a study focusing on comparing functional MRI of those who meditated versus those who did not, researchers found that those who meditated showed more stability in their ventral posteromedial cortex. This region of the brain is associated with spontaneous thought and mind wandering. Increased stability in the ventral posteromedial cortex is thought to aid in bettering focus and attention span, consequently reducing anxiety (Pagnoni, 2012).

In a study conducted by Boettcher et al. (2014), mindfulness treatments consisting of 96 audio files with instructions for various meditation exercises were tested to reduce anxiety. The study aimed to evaluate the efficacy of a stand-alone, unguided, Internet-based mindfulness treatment program for anxiety (Boettcher et al., 2014). In this qualitative randomized controlled trial of 91 total participants, Becks Anxiety Inventory (BAI) results revealed that participants in the mindfulness group showed a significant decrease of anxiety from pre- to post-assessment than participants of the control group.

A quantitative synthesis related to the effectiveness of online mindfulness-based intervention (MBI) concluded that MBIs have the potential to improve mental health outcomes, most notably stress and anxiety (Black & Slavich, 2016). This meta-analysis aimed to estimate the overall effects of online MBIs on mental health. Fifteen total randomized controlled trials were included in this study. A Random-effects model was used to compute pre- and post-between-group effect sizes. Results showed that online MBIs have a small, but significant beneficial impact on depression, anxiety, and overall

wellbeing. The study concluded by suggesting MM showed favorable significance in improving mental health outcomes.

In an additional study related to electronic guided MM, a qualitative smartphone-based randomized-controlled trial was conducted with a diverse self-selecting sample. The final sample size included 194 participants recruited through advertisements in two self-development-based e-newsletters and interest groups available on Facebook and LinkedIn for six weeks. Participants were randomly assigned to engage with an empirically supported mindfulness intervention (n = 57) or a control intervention (n = 64) for ten days. Participants were instructed to follow the daily mindfulness exercises feature of the "Take 10" program by Headspace, Inc. for 10 min a day over a total of 10 days. The study used a range of assessments with established reliability and validity to measure dimensions of wellbeing at baseline and follow-up. Scales included the Satisfaction with Life Scale, Flourishing Scale, Positive and Negative Affect Scale, and the Center for Epidemiologic Studies Depression Scale. A selection of questions was also presented post-intervention to capture subjective ratings of the intervention experience. Repeated measures ANOVAs showed statistically significant increases in positive affect with medium effect size and reduced depressive symptoms with small effect size, although no statistically significant differences in satisfaction with life, flourishing, or negative affect were found. No statistically significant gains were observed in the control group. Findings support the viability of smartphone-based interventions to significantly enhance elements of general wellbeing related to stress and anxiety (Howells et al., 2016).

In a qualitative randomized control study conducted by Economides et al. (2018), researchers aimed to assess whether completing the first ten introductory sessions of the mindfulness-based smartphone app Headspace impacted stress, affect, and irritability relative to active control. Participants were recruited via a third-party participant recruitment service to participate in a randomized controlled trial. The study had a final sample size of 69 participants. The mindfulness intervention was delivered via the Headspace mindfulness-based smartphone app and consisted of the app's first ten introductory sessions. Outcomes were measured using the Stress Overload Scale, Scale of Position, and Negative Experience, as well as a Brief Irritability Test. Interventions were effective at reducing stress associated with personal vulnerability. The mindfulness intervention had a significant positive impact on irritability, affect, and stress resulting from external pressure. These results suggest that brief mindfulness training has a beneficial impact on several aspects of psychosocial wellbeing and that smartphone apps are an effective delivery medium for mindfulness training (Economides et al., 2018).

In a separate longitudinal study, researchers investigated amplitude of low-frequency fluctuations (ALFF) changes following 40-day mindfulness meditation training. "The results centered on the parietal cortex with a relative increase in cortical thickness in the left precuneus, which significantly showed decreased ALFF (C.-C. Yang et al., 2019, p. 5)." Furthermore, these decreases were associated with reductions in anxiety and depression symptoms.

Research has suggested that mindfulness meditation is associated with noteworthy health outcomes, including reduction of anxiety. In a more recent, eight-week

randomized controlled trial of 177 participants, a mindfulness program delivered online was proven to influence symptoms of anxiety among students at the University of Oxford during the COVID-19 pandemic (Simonsson et al., 2021). Students completed four-item versions of the Patient-Reported Outcome Measurement Information System (PROMIS) anxiety and depression scales. Participants randomized to the mindfulness condition detected a significantly greater reduction in anxiety over time (B=-0.36, t=-2.25, p=.025) than the ‘waitlist’ condition (Simonsson et al., 2021).

Summary Paragraph

Based on the literature review, it can be concluded that various forms of mindfulness meditation, specifically electronic guided MM, significantly decreases anxiety and anxiety related symptoms/disorders in the general populace. Qualitative changes regarding mood and affect have been noted and additionally, measurable structural changes within the brain related to positive emotional outcomes reported. Research has made strides in the past decade regarding proving the effectiveness of mobile MM technology. However, there is a lack of evidence to determine if just a brief intervention of electronic meditation delivery can be directly correlated to effective aid in the management in anxiety in those inhabiting in rural geographical locations. The primary aim of this DNP project is to utilize current evidence-based information and apply a brief intervention of MM in hopes of improving how we approach treatment and management of anxiety experienced in individuals living in rural places, who may not have access to supplemental resources.

Theoretical Framework

The theoretical basis for the DNP project at hand is based on a popular stress theory studied in nursing known as the stress, coping and adaptation (McEwen & Wills, 2019) theory by Lazarus & Folkman (1987). This theory explores how a person copes with stressful situations and adapts to them. According to McEwen & Wills (2019), adaptation is thought to be the capacity of a person to flourish and survive.

Lazarus's theory states that successful coping results in adaptation rather than maladaptation (McEwen & Wills, 2019). "Stress occurs when a person perceives the demands of an environmental stimuli to be greater than their ability to meet, mitigate, or alter those demands (Epel et al., 2018)". Disequilibrium of perceptions and maladaptation may result in physiologic, psychological disorders (McEwen & Wills, 2019). Mindfulness meditation allows recognition of feelings and thoughts associated with anxiety, while being a helpful coping mechanism to utilize within oneself. Once effective coping occurs, we can successfully change the meaning of the situation once perceived as a threat (McEwen & Wills, 2019).

In Lazarus' theory, once the person learns to cope with a situation, self-reappraisal occurs. This reappraisal process allows for feedback about the outcome and adjustment to new information (McEwen & Wills, 2019). Adjustment or adaptation to new information results in psychological wellbeing, overall health, and social functioning. With the application of this theory in conjunction to the use of MM, individuals may become more aware of cognitive thoughts and behaviors that contribute to worsening anxiety and, therefore, improve overall functioning.

The theoretical model of stress and coping developed by Lazarus and Folkman (1987) illuminated coping as a phenomenon involving cognitive and behavioral responses that individuals use to manage internal and external stressors. By practicing technology-guided MM, one can gain awareness on areas that contribute to anxiety and develop skills to decrease it. According to McEwen & Wills (2019), coping, when considered as a process, is characterized by dynamics and changes that are functions of continuous appraisals and reappraisals of the shifting person environmental relationship. Stress and adaptation go hand in hand with heightening self-awareness and actualization associated with MM.

Chapter Three

Introduction

This DNP project was implemented within self-reported rural populations occurring within the United States. Participants enrolled in the project were asked to individually complete seven guided MM sessions at their own leisure within two weeks (14 calendar days). Project intervention was completed in various locations dependent on individual preference. Participants were asked to complete the Zung Self-Rating Anxiety Scale (SAS) prior to starting meditation sessions, as well as after finishing all seven sessions. Zung Self-Rating Anxiety Scale scores as well as additional data points were collected and analyzed using Qualtrics. Data then was exported into Microsoft Excel and sent to a statistician for analysis.

Sample and Setting

Inclusion criteria for the study required people to reside in a rural geographic location, be over the age of 18 years of age, have internet access, and be able to follow written and spoken directions. There was a total of 12 participants who enrolled in the project, with one participant dropping, leaving a remaining 11 participants. Short term convenience sampling methodology was utilized, including the use of social media, clinic broadcasting, flyers, and word of mouth recruitment.

IRB Approval Process

The Institutional Review Board (IRB) at Northern Michigan University granted permission to conduct human research as there were no identifiable risks to the participants in the project. Approval for IRB was electronically obtained on November 8, 2022.

Design and Procedures

Participants were asked to complete seven digitally guided MM sessions via the Insight Timer application platform on a device of their choice. The application was free to participants during the research period. Project data were collected pre and post intervention via questionnaire results at the end of the defined 14-day period. Data was entered and managed using Qualtrics. Qualtrics is a secure, web-based software platform designed to support data capture for research studies. Permission to utilize Qualtrics was given by the university for research purposes.

Measures

Instruments employed in the project include Zung Self-Rating Anxiety Scale (SAS) (Appendix A), as well as enrollment questionnaires to determine inclusion eligibility, and informed consent. The SAS is constructed so that the less anxious patient will have a low score. The Zung SAS is based on the same 20 diagnostic criteria as the observer-rated Anxiety Status Inventory (Zung, 2013). Some of the questions within the measure are worded symptomatically negative, and therefore scoring must be adjusted accordingly (Zung, 1971).

Zung Self-Rating Anxiety Scale (SAS) questionnaires were provided prior to and after the seven guided MM sessions were completed and were returned either by email.

Zung Self-Rating Anxiety Scale (SAS) has shown sufficient reliability and construct validity to justify measuring levels of anxiety (Dunstan et al., 2017a). The scale is considered a public domain, and as the original author is deceased, permission to use this scale was not necessary for this project.

Data Analysis

Numerical data for Zung Self -Rating Anxiety Scale (SAS) was collated via Likert scale methodology via Qualtrics. Scores were calculated and entered for statistical analysis into Microsoft Excel for tracking and analyzed using statistical software. Statistical analysis including a permutation test was performed by and interpreted by a statistician and this author. All data collected and analyzed throughout the duration of the DNP project is stored and locked in an electronic or physical file for six years and then will be destroyed/deleted. All email addresses/participation information is private.

Chapter Four

Introduction

This chapter will outline the analysis of data collected in a DNP project aimed to study the efficacy of a brief intervention of electronic guided MM via the Insight Timer application. Insight Timer is a mobile application offering guided MM sessions, calm sessions, music, courses, and workshops in various languages for ages 12 and up. The application's mission is to provide cost-effective avenues for health promotion including stress and anxiety reduction (Insight Network Inc, n.d.).

The project aimed to use the Insight Timer application as a tool to reduce anxiety scores in a rural population. The intervention included seven individual sessions of MM guided by Insight Timer professionals. Each session ranged anywhere from 7-12 minutes in length. Participants were asked to complete each consecutive session on different days at their own leisure, utilizing electronic device of their choice, within two weeks.

Data were collected over a period of 14 calendar days. Participants for the study were over the age of 18 and had to live in a rural geographical location, by self-report. Participants took the Zung Self-rated Anxiety Scoring tool (SAS) test before using the app for seven sessions, as well as after the sessions. These scores are the summation of the numerical data being analyzed in this report. The research question of interest was: Do participants utilizing the meditation app Insight timer for a brief period lower their SAS scores?

Demographic Information

Likely due to the short-term nature of convenience sampling used for the project, 12 participants enrolled, despite hope for a much larger sample size. Eleven participants completed the intervention and the pre/post questionnaires. Demographic information was obtained for the project although was not utilized for any statistical analyses. All 12 original participants identified as white and included three males and nine females. Ages of participants ranged from 21-65 years. Level of education for participants ranged from G.E.D to graduate degrees. Household income was asked to be disclosed, with results varying from < $20,000 ->$100,000 USD. Demographic information was not factored when conducting statistical analysis.

Statistical Analysis

There were 11 participants included in the statistics. Each participant completed a pre-intervention and a post-intervention survey employing the Zung SAS. Results from the Zung SAS were extracted and analyzed for statistical significance. Testing was performed through the data software package R Core Team, by Tidyverse (2019), via statistician. Analysis of collected data was carried out via permutation testing. Permutation testing was used to provide a stimulated null distribution to calculate an observed mean of the differences and generate a simple p-value.

Results

Outcomes from the permutation testing yielded a statistically significant p-value of 0.0013. The small p-value supports evidence to have rejected the null hypothesis. The observed mean of the differences is -14.4. Looking at a generated plot of the differences, it is seen that most participants had negative differences. This renders evidence that brief Insight Timer application usage is associated with a decrease in Zung SAS scores among this group of participants.

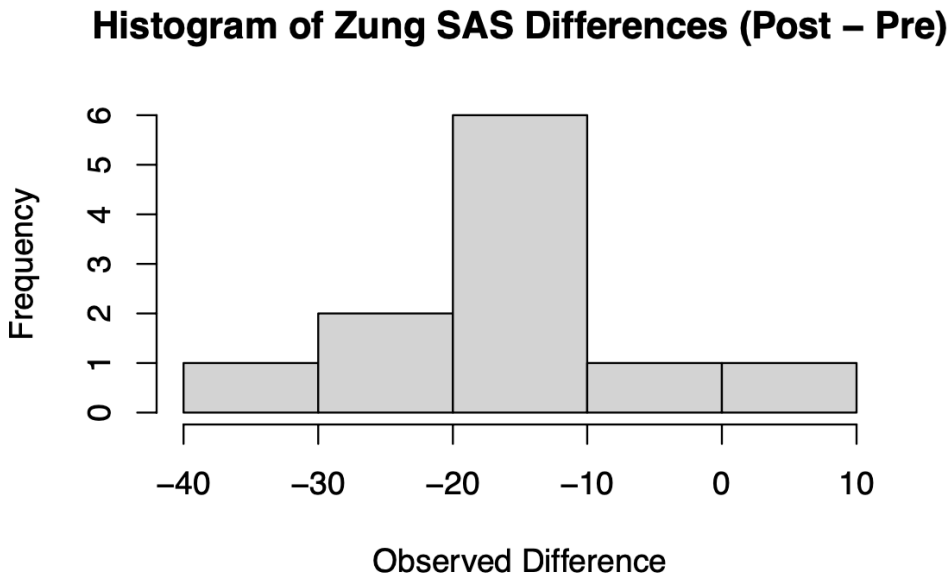

Figure 1

Discussion

To start with the conclusions of the analysis, do participants utilizing the Insight Timer meditation app for a brief period lower their SAS scores? Given the results of the permutation test used to analyze this DNP project, there is strong evidence that the use of the app was associated with a decrease in the mean difference of anxiety scores for participants. The outcomes are associations to the sample. When compared with results obtained from other researchers who have conducted similar work, results are consistent with similar outcomes of anxiety reduction.

As previously noted in the literature review section of chapter two, electronic application guided MM sessions are being further studied to ascertain benefits in managing stress and anxiety in various individuals. In a randomized controlled trial of 91 participants, we seen significant decrease in anxiety after a few sessions of MM (Boettcher et al., 2014). In a separate qualitative randomized control study conducted by Economides et al. (2018), researchers found that just with 10 sessions of introductory application guided MM, individuals experience reduced stress.

Mindfulness meditation seemingly provides an avenue for mental health enhancement. In studies focusing more on objective observations of those who meditated versus those who did not; Researchers found that those who meditated on a regular basis subsequently improved areas of the brain associated with reducing anxiety. Instances include visual increased stability in their ventral posteromedial cortex (Pagnoni, 2012), as well as decreased ALFF fluctuations on

MRI reflecting spontaneous neuronal activity and an increase in cortical thickness in the left precuneus (C.-C. Yang et al., 2019, p. 5).

Though this study was small, it does provide contribution to previously studied evidenced based research supporting beneficial effects of MM. The use of the electronic guided MM program, Insight Timer, was positively proven to be statistically significant in a small cohort of rural participants.

Clinical Implications for Practice

Reported anxiety and anxiety related disorders are on the rise (Goodwin et al., 2020b). Statistically significant data collected from this small DNP project findings allows contribution to clinical practice by providing an affordable, attainable, and accessible benign intervention proven to reduce anxiety. The beneficial effects of MM are shown to aide in anxiety reduction and can be taught to be utilized as an effective coping mechanism when dealing with anxiety. Individuals and health care practitioners can consider MM as a useful tool to aide when considering adjunctive therapy for management of anxiety.

Recommendations for Future Research

Further research on inexpensive, attainable tools for anxiety is important, especially in rural areas that may be underserved. Based on the findings from this DNP project, future research on a larger scale regarding this topic is strongly recommended. A longitudinal, prospective study with more participants, controls, and participant follow-up would yield for greater evidence-based support. Though there is a large amount of research on the positive effects of MM, more studies on electronic guided MM need to be

performed to definitively conclude whether just a brief intervention of electronic guided MM is successful in reducing anxiety scores.

Strengths

Randomized sampling technique was utilized, providing for strength of the study. The SAS scale used for analyzing anxiety scores pre and post procedure was proven to be reliable/valid (Dunstan et al., 2017b), and a strong indicator of situational anxiety when accurately filled out. Participation follow through was successful at 83%. Results from the study were found to be significant in a small convenience sample.

Limitations

The project sample size for this population is particularly small for noteworthy contribution to research. The design of the study provided for various outside factors for potential influence on scores. The SAS instrument chosen for evaluation focuses on situational anxiety scores and are subject to change dependent on situation outside of researcher's control. Numerical data was dependent on solo unsupervised participation entry, which could allow room for error or dishonest answers. Sampling was obtained via convenience methods. Lack of a control and treatment group to postulate casual effect provides for a weaker design. Environmental factors of participants were not regulated nor monitored during the length of the study. Further follow-up with participants was not performed, therefore providing no advantageous information on maintenance in reduction of anxiety scores following the brief intervention.

Conclusion

Anxiety is a typical physiological stress response that everybody experiences to some degree in their lifetime (American Psychological Association, 2022). It can be bothersome to some individuals or become a disorder or chronic concern. The purpose of the DNP project was to study whether a brief intervention of Mindfulness Meditation (MM) delivered via electronic application was beneficial in reducing situational anxiety scores in adults in a rural area. Statistical analysis concludes that the small study of 11 participants generated a statistically significant outcome for reduction of anxiety scores via the Zung Self Rating Anxiety Scoring (SAS) questionnaire.

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Appendix A

Zung Self-Rating Anxiety Scale (SAS)

	None OR A little of the time	Some of the time	Good part of the time	Most OR All of the time
1. I feel more nervous and anxious than usual				
2. I feel afraid for no reason at all				
3. I get upset easily or feel panicky				
4. I feel like I'm falling apart and going to pieces				
5. I feel that everything is all right and nothing bad will happen				
6. My arms and legs shake and tremble				
7. I am bothered by headaches, neck and back pains				
8. I feel weak and get tired easily				
9. I feel calm and can sit still easily				
10. I can feel my heart beating fast				
11. I am bothered by dizzy spells				
12. I have fainting spells or feel like it				
13. I can breathe in and out easily				
14. I get feelings of numbness and tingling in my fingers, toes				
15. I am bothered by stomachaches or indigestion				
16. I have to empty my bladder often				
17. My hands are usually dry and warm				
18. My face gets hot and blushes				
19. I fall asleep easily and get a good night's rest				
20. I have nightmares				

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