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Meditation App Use May Decrease State Anxiety*

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L'USO DI UN'APP DI MEDITAZIONE PUÒ RIDURRE LO STATO D'ANSIA

ABSTRACT

*The goal of this study was to evaluate the relationship between a meditation app and anxiety. The effect of a free 13 minute guided meditation exercise (Take a Break!) on State Trait Anxiety Inventory (STAI) scores was evaluated in a normative sample of 75 undergraduate students. The only significant group difference was for state anxiety after intervention, such that the meditation group had lower state anxiety after meditation than the control group after waiting. This is an important finding because everyday life presents many challenges that increase anxiety, and having a tool that simply takes a 13 minute break is very valuable. Most people of all ages always have a cell phone with them which would make the this app very available in times of stress. This very brief intervention could be used in many settings, such as work, schools, sports, and home. Having a tool that has been validated empirically would give great credibility to suggest-
ing it's use in these settings.*

Keywords: Anxiety; App; Meditation; Mindfulness; Stress.

* There was no funding for this study. Data will be shared to the extent that they are found in the current tables. This study was not pre-registered. The authors were responsible for study conceptualization, data collection, data preparation, data analysis, report writing. There was no conflict of interest.

1. INTRODUCTION

There is much research that shows that mindfulness meditation can result in decreased anxiety. The terms mindfulness and meditation are often used interchangeably, but mindfulness refers to increased awareness in a nonjudgmental manner in the present moment (Kabat-Zinn, 1994), and meditation is a practice. Meditation involves a technique, such as mindfulness, or focusing on breathing or relaxing the body etc. to train attention (e.g., Shapiro *et al.*, 2018). Both mindfulness and meditation usually have the effect of calming oneself and clearing the mind and are thus very similar in their outcomes. Given this similarity, the effect of both on anxiety will be discussed.

A meta-analysis by Vollestad *et al.* (2012) showed the strong effect of mindfulness-based interventions on clinically anxious participants. A meta-analysis by Khoury *et al.* (2015) reported a moderate effect of mindfulness-based stress reduction (MBSR) on anxiety in non-clinical populations. Vietan and Astin (2008) reported that mindfulness interventions significantly reduced anxiety in sub-clinically anxious groups. These findings were over weeks or months of usage of mindfulness.

Given the widespread use of apps available on phones, some recent research has focused on using mindfulness/meditation apps to improve mental health variables. Most of these studies have focused on clinical populations and use mindfulness apps over weeks or months to evaluate changes in these mental health variables. A study by Abbott, Lack, and Anderson (2023) used the Headspace mindfulness meditation app (Headspace Inc., 2010) in participants with moderate to high anxiety over a period of 4 to 8 weeks. They found that both four and eight week conditions of Headspace usage significantly reduced anxiety symptoms.

Flett *et al.* (2020) reported small improvements in psychological distress with Headspace usage over two semesters in 120 undergraduate students. Flett *et al.* (2019) reported that 72 undergraduate students who used Headspace indicated less depression at 10 and 40 days. Another meditation app called Smiling Mind (2017) did not affect depression. Kubo *et al.* (2018) reported improvement in psychological distress in 19 cancer patients after usage of Headspace for eight weeks.

Bostock *et al.* (2019) reported that 238 healthy employees who used Headspace for an average of 17 sessions over eight weeks had lower systolic blood pressure less distress and greater well-being compared to a control group. Cox *et al.* (2019) reported improvements in depression for 31 patients discharged from the ICU after a month of weekly usage of recorded video and audio files delivering guided meditation and mindfulness exercises, including focusing on breathing, body awareness, and environmental

sound. Lee and Jung (2018) reported that 77 undergraduate students using the DeStressify app 5 days a week for four weeks had decreased trait anxiety and improved emotional well-being compared to a control group. State anxiety did not show improvement after the four weeks.

There are currently only a small number of studies that have evaluated the effects of mindfulness/meditation apps on mental health, and only a few of these have focused on anxiety. Most of these studies have used Headspace, a popular meditation app, which has an annual fee. Little to no data exist on the *immediate* effect of mindfulness/meditation apps on emotional variables, in clinical or normative populations. In the present study, the Take a Break! meditation app was used, as it is free and available for iPhone and Android phones (Maddux & Maddux, 2011). The effect of this 13 minute guided meditation exercise on anxiety was evaluated in a normative sample.

2. METHOD

2.1. *Participants*

Seventy-five undergraduate students (40 in meditation group, 35 control participants) were evaluated for this study. The mean age of the participants was 22.1 years (SD of 4.7) and included 17 males and 58 females. The two groups did not differ for age or gender composition. The participants were recruited from undergraduate psychology classes (which typically have more female than male students) and received extra credit for participating. The study was approved by the Institutional Review Board and informed consent was obtained.

2.2. *Instruments*

- *State Trait Anxiety Inventory* (STAI) – The State Trait Anxiety Inventory was developed by Spielberger and colleagues (Spielberger *et al.*, 1983; Spielberger, 1989). Form Y was used and there are 20 state and 20 trait anxiety questions to which the participant responds on a four point scale. For the State inventory, the participant is asked to report how they feel right now. For the Trait inventory, the participant is asked to report how they generally feel. Test-retest reliability (.65-.75), internal consistency (.86-.95), concurrent and face validity are all adequate.

- *Take a Break!* – The Take a Break! meditation app (Maddux & Maddux, 2011) was used because it is available on both iPhone and Android phones, and is free. It offers a 13 minute guided meditation which was used in this study. The guide suggests that the person close their eyes and notice their mind in the present moment. She has the person focus on whether they're feeling pressure or stress and to just notice it. She encourages them to allow these feelings and release them, and to let thoughts come and go, letting go of their meaning. She encourages them to notice if their mind wanders and then just gently bring it back to the present moment. She encourages them to notice if emotions are found in their body and let them pass and return to the present moment, and notice the restfulness of letting go. Gentle breathing and relaxing muscles to let go of stress are also suggested.

2.3. Procedure

After the informed consent was obtained, participants completed the State Trait Anxiety Inventory. In the experimental condition, participants were instructed to download the Take a Break! app to their phone and sit quietly with eyes closed while listening to the 13 minute meditation app. The participants in the control condition simply sat in the waiting area for this time. After completion, participants took the State Trait Anxiety Inventory again.

3. RESULTS

A multivariate analysis of variance was done on the state and trait anxiety scores with intervention group (meditation versus waiting) as a between subjects factor, and before vs. after intervention as a within subjects factor. There was a main effect of meditation versus waiting group ($F(1,73) = 7.31$; $p = .009$) and of before vs. after intervention ($F(1,73) = 46.76$; $p < .001$). There was an interaction between group and before versus after intervention ($F(1,73) = 11.77$; $p < .001$). These patterns are shown in *Figure 1*. Further analyses indicated that the only significant group difference was for state anxiety after intervention, such that the meditation group had lower state anxiety after meditation than the control group after waiting. The means and standard deviations and significance values are shown in *Table 1*.

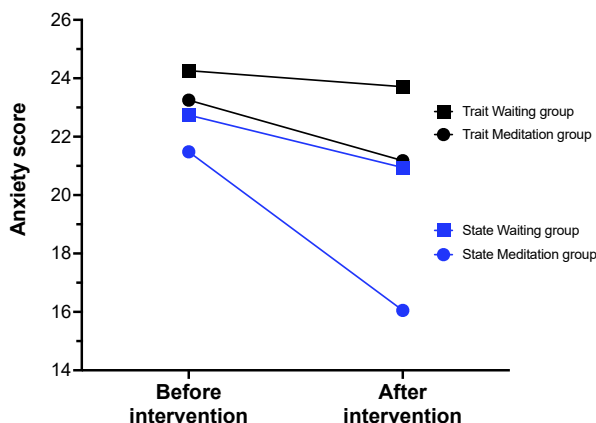


Figure 1. – State and trait anxiety.

Table 1. – Means (standard deviations) and meditation vs. waiting group differences.

	GROUP		F (<i>p</i>)
	MEDITATION	WAITING	
BEFORE			
State Anxiety	21.48 (5.23)	22.74 (6.49)	.88 (.352)
Trait Anxiety	23.25 (5.28)	24.26 (7.93)	.429 (.515)
AFTER			
State Anxiety	16.05 (4.26)	20.94 (5.67)	18.13 (< .001)
Trait Anxiety	21.18 (5.49)	23.71 (7.92)	2.66 (.107)

4. DISCUSSION

The only significant group difference was for state anxiety after intervention, such that the meditation group had lower state anxiety after meditation than the control group after waiting. Thus, the Take a Break! app effectively reduced anxiety after the 13 minute condition. This is an important finding because everyday life presents many challenges that increase anxiety, and having a tool that simply takes a 13 minute break is very valuable.

Many people with mental health issues do not receive treatment for many reasons, including a wish to handle things on their own or inability to afford treatment (e.g., Roness *et al.*, 2005). The significance of this study

is that it reports a relatively quick method to decrease anxiety in the immediate timeframe.

Many of the handful of studies that have evaluated mindfulness meditation apps on mental health, have used Headspace. Headspace requires an annual fee and registration whereas the Take a Break! app used in the present study is free and available on iPhone and Android phones.

This tool would be very useful in school settings. It is well known that children experience much stress, and introducing them to a tool that can help them calm down would be very valuable. It could help them address anxiety, both in the school setting as well as anxiety in the home setting. Instead of simply removing a child who has behaved poorly from the classroom, the child can be encouraged to use this guided meditation to help calm down.

The limitations of the present study include a small sample size, and that it was a normative sample of undergraduate students. A larger sample with participants from a larger age range and education level would be of great interest. Additionally, evaluating this in clinical groups as well as normative groups would also provide important information.

In sum, the present study showed that using a free 13 minute guided mindfulness app decreased anxiety in the immediate timeframe. This app could thus be a quick, useful tool to help deal with the stressors we encounter on a daily basis.

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RIASSUNTO

L'obiettivo di questo studio era valutare la relazione tra un'app di meditazione e l'ansia. L'effetto di un esercizio di meditazione guidata gratuito di 13 minuti (Take a Break!) sui punteggi dello State Trait Anxiety Inventory (STAI) è stato valutato in un campione normativo di 75 studenti universitari. L'unica differenza significativa tra i gruppi

riguardava lo stato d'ansia dopo l'intervento, tanto che il gruppo di meditazione presentava uno stato d'ansia inferiore dopo la meditazione rispetto al gruppo di controllo dopo l'attesa. Questo è un risultato importante perché la vita quotidiana presenta molte sfide che aumentano l'ansia e avere uno strumento che semplicemente richiede una pausa di 13 minuti è molto prezioso. La maggior parte delle persone di tutte le età ha sempre un cellulare con sé, il che renderebbe questa app molto disponibile nei momenti di stress. Questo intervento molto breve potrebbe essere utilizzato in molti contesti, come lavoro, scuola, sport e casa. Avere uno strumento validato empiricamente darebbe grande credibilità al suggerimento del suo utilizzo in questi contesti.

Parole chiave: Ansia; App; Consapevolezza; Meditazione; Stress.

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