

# **MINDFULNESS, SOMATIC AND COGNITIVE SYMPTOMS OF ANXIETY, AND SELF-ESTEEM: A RANDOMIZED CONTROLLED TRIAL**

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## **Abstract**

Empirical studies have demonstrated the beneficial impact of mindfulness on anxiety and well-being. However, there is a lack of research related to the relationship between mindfulness and symptoms of somatic and cognitive anxiety as distinct dimensions of anxiety. Thus, this study aims to investigate whether a mindfulness-based intervention may improve levels of cognitive and somatic anxiety and self-esteem. Cognitive symptoms of anxiety include feelings of tension, rumination, and negative thoughts, while somatic symptoms include sweating, hyperventilation, elevated heart rate, and blood pressure. A randomized experimental design with a 3x2 between-subjects design was employed. The intervention consisted of two experimental groups of guided meditation alone and guided meditation followed by deep breathing, and a control group. Overall, the intervention reduced symptoms of somatic and cognitive anxiety, while no effect on self-esteem was found. These findings fill a substantial gap in the existing literature and have important implications related to the potential of mindfulness as a tool for treating anxiety. Meditation provides a solution for these drawbacks, as it is cost-effective, does not require too much time (can last from 10 minutes to more than an hour depending on the patient's previous experiences with meditation), and is a stigma-free practice

**Keywords:** *Mindfulness, meditation, deep breathing, somatic anxiety, cognitive anxiety, self-esteem.*

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## **1. Introduction**

Cognitive symptoms of anxiety include feelings of tension, rumination, and negative thoughts, while somatic symptoms include sweating, hyperventilation, elevated heart rate, and blood pressure (Gelenberg, 2000; Parmentier et al (2019) found that mindfulness decreases symptoms of anxiety and depression in the general population by reducing rumination and worry, and by increasing cognitive reappraisal. Wielgosz et al (2016) found that long-term mindfulness is related to a slower respiration rate, a finding also supported by EEG spectral data (Ahani et al., 2014). Other physiological changes associated with mindfulness are decreased heart rate and blood pressure (Ditto et al., 2006). The aim of this study is to investigate whether a four-day mindfulness-based intervention will reduce cognitive and somatic anxiety and enhance self-esteem among a non-clinical sample. A randomized experimental design with a 3x2 between-subjects design will be employed. The intervention consists of two experimental groups which will practice guided meditation and guided meditation followed by deep breathing respectively, and a control group of music relaxation.

## **2. Literature review**

Based on the evidence provided by existing empirical data, and the potential of mindfulness to be an alternative psychotherapeutic approach for treating anxiety disorders, this study aims to assess and compare the effects of guided meditation, guided meditation followed by deep breathing techniques, and music relaxation on anxiety levels, blood pressure, heart rate, and self-esteem. Guided meditation and deep breathing led to significant decreases in both systolic and diastolic blood levels and heart rate, meanwhile guided meditation alone led to significantly decreased systolic blood pressure and increased diastolic blood pressure. Our second hypothesis, that guided meditation and deep breathing would lead to a larger decrease

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in anxiety levels and increase in self-esteem levels than guided meditation alone and music relaxation, was partially supported by the data.

### 3. Method

The participants were distributed among the intervention groups through random assignment, with 11 participants in each group. Levels of cognitive and somatic anxiety and self-esteem were measured using the following scales: The State-Trait Inventory for Cognitive and Somatic Anxiety (STICSA), is a validated self-report questionnaire designed to differentiate cognitive and somatic symptoms of anxiety (Ree et al., 2008). The Rosenberg Self-Esteem Scale (RSE), a validated survey instrument designed to assess global self-esteem (Rosenberg, 1965) consists of 10 items, which the participants had to rate on a Likert scale from 1 (strongly agree) to 4 (strongly disagree). Independent samples t-tests were conducted at a  $p < .05$  significance level to test for gender differences in levels of somatic anxiety, cognitive anxiety, and self-esteem before and after the intervention. Paired samples t-test at a  $p < .05$  significance level was conducted to evaluate the effect of the intervention on somatic anxiety, cognitive anxiety, self-esteem for each intervention group separately, and the overall impact of the intervention on all groups.

### 4. Results

#### 4.1. Independent samples t-tests

Table 1. Results of the independent samples t-test for gender differences pre- and post-intervention.

Pre-Intervention						
Variable	F		M		t	p
	M	SD	M	SD		
Somatic anxiety	18.1	4	14.57	3.5	2.131	.0041
Post-Intervention						
Self-esteem	15.92	1.87	14	2.82	2.157	.039
Cognitive anxiety	16.84	4.59	13.42	2.22	2.773	.011

Note. M = Mean. SD = Standard deviation. m = Male. f = Female

Female participants showed higher levels of somatic anxiety ( $p = .0041$ ). No significant gender differences were found in cognitive anxiety and self-esteem before the intervention. Post-intervention scores showed that female participants had higher levels of cognitive anxiety ( $p = .011$ ) and self-esteem ( $p = .039$ ). No significant gender differences were found in post-intervention scores for somatic anxiety. Follow-up assessments one month after the intervention found no significant gender differences.

#### 4.2. Paired-samples t-tests

Table 2. Results of the paired samples t-test for mean differences between the three conditions (guided meditation, guided meditation, and deep breathing, and control group).

Variable	Pre-intervention		Post-intervention		t	p	$\eta^2$	$\eta^2$ 95% CI [LL, UL]
	M	SD	M	SD				
Guided Meditation + Deep Breathing								
Cognitive anxiety	19.54	4.00	15.45	3.47	2.507	.031	.32	[.45, 7.72]
Control Group (Music Relaxation)								
Somatic anxiety	16.90	5.12	13.09	1.81	2.80	.019	.43	[.78, 6.84]

Note. M = Mean. SD = Standard deviation.  $\eta^2$  = Partial eta square value. CI = Confidence interval. LL = Lower limit. UL = Upper limit.

No significant differences were found for cognitive anxiety, somatic anxiety, or self-esteem. Follow-up assessment found a significant decrease in self-esteem levels. The mean decrease in self-esteem level was 1.54 ( $p < .043$ ) with a 95% CI [0.062, 3.028]. The partial  $\eta^2$  (.35) indicated a large effect size.

## 5. Discussion

This study is the first to investigate the relationship between mindfulness, somatic and cognitive dimensions of anxiety, and self-esteem. However, no previous studies have assessed the relationship between mindfulness meditation and somatic and cognitive anxiety as distinct dimensions of anxiety. Guided meditation and deep breathing led to significant decreases in cognitive anxiety, while guided meditation only did not affect either. This study presents novel findings, as there is a lack of research on the relationship between mindfulness and the cognitive and somatic dimensions of anxiety.

## 6. Conclusion

The results of this study provide highly significant practical implications for the plausibility of meditation as an effective therapeutic approach. Guided meditation and deep breathing resulted efficacious in reducing cognitive anxiety among the study participants. Overall, the psychological and physiological impact caused by meditation and deep breathing needs to be investigated more in detail, in order to establish whether and how mindfulness may produce changes in psychological well-being, which may eventually have implications for perceived health, life satisfaction, subjective well-being, and overall quality of life. Meditation provides a solution for these drawbacks, as it is cost-effective, does not require too much time (can last from 10 minutes to more than an hour depending on the patient's previous experiences with meditation), and is a stigma-free practice.

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