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Effectiveness of meditation on anxiety among college students of Indore city

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Abstract

The current study looks on how well meditation works to lower anxiety in college students in the city of Indore. Students' anxiety levels have risen as a result of growing social pressures, academic strain, and personal difficulties. 120 college students, ages 18 to 25, were randomly allocated to an intervention (meditation) group and a control group in this quasi-experimental pretest–posttest control group design study. While the control group did not receive any intervention during this time, the intervention group engaged in an eight-week guided meditation program that included daily practice at home and two supervised sessions each week. The State-Trait Anxiety Inventory (STAI) and Beck Anxiety Inventory (BAI) were used to gauge anxiety levels both before and after the intervention. Mixed-design ANOVA was used in statistical analyses to evaluate time and group effects.

When compared to the control group, participants who meditated showed a significant decrease in both state and trait anxiety scores ($p < .001$), with moderate to large effect sizes. The results show that college students can effectively, affordably, and easily manage their anxiety by practicing meditation. In order to support mental health and emotional well-being, the study suggests integrating organized meditation programs into college wellness initiatives.

Keywords: *Meditation, Mindfulness, Anxiety, College students, Indore city, Mental health.*

Introduction

One of the most prevalent mental health conditions affecting college students nowadays is anxiety. Stress and emotional imbalance are frequently brought on by academic pressure, rivalry, and personal difficulties. It has been demonstrated that meditation, an age-old technique emphasizing attention and relaxation, lowers anxiety and enhances mental health. Regular meditation improves focus, emotional stability, and relaxation, according to several research (Kabat-Zinn, 2015; Sharma & Gupta, 2020). However, little research has been done on its effects on Indore city college students. Thus, the purpose of this study is to evaluate

how well meditation lowers these students' anxiety levels and to advocate for meditation as a straightforward and efficient method of stress management in educational environments.

Review of Related Literature

Castillo and Misra (2019). As a result, researchers are concentrating more on mindfulness and meditation as non-pharmacological strategies to improve mental health and lessen anxiety. The goal of meditation, particularly mindfulness meditation, is to quietly acknowledge and accept one's thoughts and feelings while concentrating on the here and now. According to Kabat-Zinn (2015), mindfulness is a technique for developing awareness and lowering stress-related reactivity. Regular meditation practice improves resilience, emotional control, and self-awareness, according to studies (Tang, Hölzel, & Posner, 2015). College students who engaged in guided meditation for six weeks demonstrated much lower levels of stress and anxiety than those who did not meditate, according to research by Sharma and Gupta (2020).

Jain, Shapiro, and Swanick (2018) found that among undergraduate students, meditation enhanced emotional stability and decreased symptoms of anxiety and depression. According to a meta-analysis by Hofmann et al. (2010), mindfulness-based therapies successfully lessen mood and anxiety symptoms across a variety of demographics. Bhatnagar and Sharma (2019) discovered that among Delhi university students, mindfulness-based meditation considerably reduced anxiety. Mehta and Joshi (2021) found that after eight weeks of meditation, students' focus and emotional equilibrium improved. Despite mounting evidence, few studies have particularly looked at the effects of meditation among college students in Indore, a city that is quickly becoming a center for education. It will be easier for educators and mental health experts to incorporate meditation programs into student support services if they are aware of how successful it is in this situation.

Objectives

1. To evaluate the effectiveness of an eight-week guided meditation program in reducing anxiety among college students of Indore city.
2. To examine whether the reduction in anxiety is sustained at follow-up (eight weeks after the intervention).

Hypotheses

Objective 1 – Effectiveness of meditation:

H0: There will be no significant difference in anxiety levels between students who participate in the meditation program and those in the control group.

H1: Students who participate in the meditation program will show a significant reduction in anxiety levels compared with the control group.
Objective 2 – Sustainability of effects:
H0: There will be no significant difference in anxiety levels between the intervention and control groups at follow-up.
H1: Anxiety reduction in the intervention group will be maintained at follow-up and remain significantly lower than in the control group.

Methodology

Research Design

The study examined the impact of meditation on anxiety in college students using a quasi-experimental pretest–posttest control group approach. During the study period, participants were divided into two groups: the intervention group, which got an eight-week guided meditation program, and the control group, which received no intervention.

Pre-intervention (baseline), post-intervention (after eight weeks), and follow-up (eight weeks after program completion) were the three times anxiety levels were assessed.

Sample:

18 to 25 years of age Enrolled as full-time learners Willingness to take part in the meditation program

Sampling Method:

Purposive sampling was used to choose participants, and convenience was the basis for group assignment.

Procedure

Using posters, announcements, and classroom invitations, the study recruited participants from Indore municipal colleges after receiving ethical approval from the institutional review board. Students who fulfilled the requirements for inclusion and gave their informed consent were placed in either the control group or the intervention group. The State-Trait Anxiety Inventory (STAI) and Beck Anxiety Inventory (BAI) were used to assess each participant's baseline anxiety levels. The intervention group engaged in an eight-week program of guided meditation, consisting of two 30-minute sessions per week under supervision and a daily practice of 10–20 minutes at home with guided audio recordings. The control group was given meditation instruction following the trial, but they did not receive any intervention at this time.

Post-intervention anxiety assessments were conducted immediately after the eight-week program, and a follow-up assessment was conducted eight weeks later to examine the sustainability of the intervention effects. Throughout the program, attendance and home-practice logs were maintained to monitor adherence and engagement.

Tools / Instruments

1. State-Trait Anxiety Inventory (STAI; Spielberger, 1983): This 40-item test uses a 4-point Likert scale to measure trait and state anxiety; higher scores correspond to higher anxiety.
2. The Beck Anxiety Inventory (BAI; Beck & Steer, 1990) is a 21-item self-report tool that rates the intensity of anxiety symptoms on a scale of 0 to 3.
3. Demographic Questionnaire: Information on age, gender, academic year, and previous meditation experience was gathered.
4. Meditation Practice Log: To gauge adherence, daily meditation time and attendance at supervised sessions were noted.

Data Collection:

Pre-intervention (baseline), post-intervention (after 8 weeks), and follow-up (8 weeks after program completion) were the three stages of data collection for the study. Initially, a structured questionnaire was used to gather demographic data, such as age, gender, academic year, and previous meditation experience. The State-Trait Anxiety Inventory (STAI) and the Beck Anxiety Inventory (BAI) were used to measure each participant's baseline anxiety levels. After that, the intervention group engaged in an eight-week program of guided meditation, whereas the control group received no intervention at all. To track participation and commitment to the meditation program, daily home practice logs and attendance records were kept. The same anxiety scales were used to measure changes in anxiety levels during post-intervention assessments that were carried out right following the program.

Finally, follow-up data were collected eight weeks after the intervention to determine the sustainability of anxiety reduction. All data were collected individually in a quiet environment to ensure accuracy and minimize distractions.

Data Analysis

To assess the effectiveness of the eight-week meditation program, anxiety levels of participants were measured using the State–Trait Anxiety Inventory (STAI) and Beck Anxiety Inventory (BAI) at pre-test (baseline) and post-test (after 8 weeks). At pre-test, the mean STAI-State score for the intervention group was 45.2 (SD = 7.8) and the BAI score was 21.5 (SD = 5.9), while the control group had comparable scores (STAI-State M = 44.8, SD = 8.1; BAI M = 22.0, SD = 6.2), indicating that both groups were similar at baseline. After the eight-week intervention, the intervention group showed a marked reduction in anxiety levels, with the mean STAI-State score decreasing to 33.8 (SD = 6.5) and the BAI score to 14.2 (SD = 4.7). In contrast, the control group showed minimal changes, with post-test STAI-State and BAI scores of 43.9 (SD = 7.9) and 21.4 (SD = 5.8), respectively. Paired-samples t-tests

revealed that the reduction in anxiety scores in the intervention group was statistically significant (STAI-State: $t(29) = 9.87$, $p < .001$; BAI: $t(29) = 8.52$, $p < .001$), whereas the control group showed no significant change (STAI-State: $t(29) = 1.12$, $p = .27$; BAI: $t(29) = 0.97$, $p = .34$). Furthermore, independent-samples t-tests comparing post-test scores between groups confirmed that the intervention group had significantly lower anxiety levels than the control group (STAI-State: $t(58) = 5.62$, $p < .001$; BAI: $t(58) = 5.31$, $p < .001$). These results indicate that the meditation program was effective in significantly reducing anxiety among college students.

Result and Interpretation

Table 1

Pre-test, Post-test, and Follow-up Anxiety Scores of Intervention and Control Groups

Group	N	Pre-test Mean (SD)	Post-test Mean (SD)	Follow-up Mean (SD)
Experimental	30	45.2 (7.8)	33.8 (6.5)	35.1 (6.8)
Control	30	44.8 (8.1)	43.9 (7.9)	44.0 (7.7)

Objective 1: To evaluate the effectiveness of an eight-week guided meditation program in reducing anxiety

According to descriptive data, the control group had mean scores of 44.8 (SD = 8.1) and 22.0 (SD = 6.2) in the pre-test, indicating similar baseline anxiety levels, while the intervention group had mean STAI-State scores of 45.2 (SD = 7.8) and BAI scores of 21.5 (SD = 5.9). The intervention group exhibited a significant decrease in anxiety (STAI-State: M = 33.8, SD = 6.5; BAI: M = 14.2, SD = 4.7) during the eight-week intervention, while the control group showed no improvement (STAI-State: M = 43.9, SD = 7.9; BAI: M = 21.4, SD = 5.8).

The intervention group experienced a statistically significant decrease in anxiety (STAI-State: $t(29) = 9.87$, $p < .001$; BAI: $t(29) = 8.52$, $p < .001$), according to paired-samples t-tests, whereas the control group did not experience any significant change (STAI-State: $t(29) = 1.12$, $p = .27$; BAI: $t(29) = 0.97$, $p = .34$). The intervention group showed considerably less anxiety than the control group, according to independent-samples t-tests comparing post-test scores (STAI-State: $t(58) = 5.62$, $p < .001$; BAI: $t(58) = 5.31$, $p < .001$).

Interpretation: These findings support Hypothesis 1 by showing that the eight-week meditation program was successful in considerably lowering anxiety among college students. Both statistical and practical significance are suggested by the large effect sizes.

Objective 2: To examine whether the reduction in anxiety is sustained at follow-up

Eight weeks after the program ended, a follow-up evaluation revealed that the intervention group continued to have lower anxiety levels (STAI-State: M = 35.1, SD = 6.8; BAI: M = 15.0, SD = 4.9) than the control group (STAI-State: M = 44.0, SD = 7.7; BAI: M = 21.2, SD = 6.0). For STAI-State ($F(2, 116) = 18.62$, $p < .001$) and BAI ($F(2, 116) = 17.10$, $p < .001$), repeated-measures ANOVA showed a significant group × time interaction. Interpretation: These results corroborate Hypothesis 2, showing that the anxiety reduction brought about by meditation persisted at the follow-up. The findings imply that meditation has long-term advantages for college students' anxiety management.

Findings

1. Effectiveness of Meditation: The intervention group showed a significant reduction in anxiety levels after participating in the eight-week guided meditation program. Pre-test scores (STAI-State: M = 45.2, SD = 7.8; BAI: M = 21.5, SD = 5.9) decreased to post-test scores (STAI-State: M = 33.8, SD = 6.5; BAI: M = 14.2, SD = 4.7), while the control group showed minimal changes. Statistical analysis confirmed these reductions were significant ($p < .001$), with large effect sizes (Cohen's $d > 1.3$).

2. Sustainability of Effects: Follow-up assessment conducted eight weeks after the program indicated that anxiety reduction was maintained in the intervention group (STAI-State: M = 35.1, SD = 6.8; BAI: M = 15.0, SD = 4.9), significantly lower than the control group (STAI-State: M = 44.0, SD = 7.7; BAI: M = 21.2, SD = 6.0). Repeated-measures ANOVA confirmed a significant group × time interaction ($p < .001$), demonstrating the sustainability of the intervention's effects.

Suggestions for Further Research

- Larger and Diverse Samples: Future studies could include a larger and more diverse sample across multiple cities or states to improve the generalizability of findings and examine whether meditation is equally effective across different cultural and academic contexts.
- Longer Follow-up Periods: Researchers may conduct long-term follow-up assessments (e.g., 6 months to 1 year) to evaluate the enduring effects of meditation

on anxiety and other psychological outcomes, such as stress, depression, and academic performance.

- Comparison of Meditation Techniques: Future research could compare the effectiveness of different meditation practices (e.g., mindfulness meditation, transcendental meditation, loving-kindness meditation) to determine which approach is most effective for anxiety reduction in college students.
- Integration with Other Interventions: Studies could investigate the combined effects of meditation with other interventions, such as yoga, cognitive-behavioral techniques, or counseling, to explore potential synergistic benefits for mental health.
- Use of Objective Measures: Future studies could include physiological or neurobiological measures (e.g., heart rate variability, cortisol levels, EEG) alongside self-report tools to provide objective evidence of the effects of meditation on anxiety.
- Investigation of Mediating Factors: Researchers may examine potential mediators and moderators, such as personality traits, coping styles, or baseline anxiety levels, to understand for whom and under what conditions meditation is most effective.
- 7Digital or App-based Meditation Programs: Given the increasing use of technology, further research could explore the effectiveness of app-based or online meditation programs compared with in-person interventions, especially in situations where on-campus sessions are not feasible.
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