



Fostering Resilience: Mindfulness-Based Interventions to Alleviate Anxiety in Higher Secondary Students

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Students in higher secondary school face several difficulties in today's technologically advanced, fast-paced society such as social stresses, academic pressure and anxiety. The present research examines the effectiveness of MBI on reducing anxiety and enhancing resilience among Eleventh Standard higher secondary students from Alagappa Model Higher Secondary School, in Karaikudi, Tamil Nadu. 60 students were chosen randomly as a sample and evenly divided into control and experimental groups, participating in a pre-test and post-test experimental design. The experimental group engaged in mindfulness training, which included practices such as breathing exercises, body scans and reflective journaling, while the control group adopted the traditional method. The findings indicated significant reductions in anxiety levels and notable improvements in resilience within the comparison between the experimental group and the control group. The findings highlight the effectiveness of mindfulness practices in promoting emotional well-being and resilience, equipping students with crucial tools to manage stress and adversity. The study emphasizes the potential of integrating mindfulness into school curricula to address mental health challenges and promote overall well-being.

Keywords: *Mindfulness-based Interventions (MBI), Resilience, Anxiety and Higher Secondary Students.*



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1. INTRODUCTION

In a fast-paced technology-driven world, high school students encounter unprecedented challenges, such as academic pressure, social isolation and anxiety. Mindfulness, an ancient practice rooted in Buddhist psychology (Dickinson, 2004), provides a powerful tool to

nurture resilience and well-being. Derived from the Pali word "sati", mindfulness encompasses awareness, attention and recollection (Dickinson, 2004). By purposefully focusing on the present moment, individuals can break free from automatic and mindless states that dominate daily

experiences and contribute to unhappiness (Creswell, 2017).

Resilience, the ability to navigate adversity and rebound from challenges, is essential for students' academic success, mental health and long-term well-being (Werner, 1993).

Resilience includes:

- Emotional regulation: Managing stress, anxiety and emotions.
- Self-awareness: Recognizing strengths, weaknesses and thought patterns.
- Adaptability: Coping with change and uncertainty.
- Problem-solving: Developing effective strategies.
- Positive relationships: Building supportive networks.
- Mindfulness practices have been proven to enhance resilience by:
 - Reducing stress and anxiety (Hölzel et al., 2011).
 - Improving emotional regulation (Grossman et al., 2013).
 - Enhancing cognitive function and focus (Mrazek et al., 2013).
 - Promoting self-compassion and self-awareness (Neff, 2011).
 - Fostering positive relationships and social connections (Kabat-Zinn, 2003).

Teaching MBI to higher secondary school students can empower them to develop resilience, alleviate anxiety and thrive in the face of adversity. This present research aims to explore the effectiveness of MBI in reducing anxiety and fostering resilience among high school students.

2. MINDFULNESS AND RESILIENCE

Mindfulness has been demonstrated to offer numerous benefits for high school students, including a reduction in stress and anxiety (Kabat-Zinn, 2003), improved focus and concentration (Zeidan et al., 2010) and enhanced emotional regulation (Grossman et al., 2013). Mindfulness practices, such as breathing exercises, body scan meditation and mindful walking; can seamlessly integrate into school curricula to bolster students' mental well-being.

Resilience is also pivotal for high school students, who encounter substantial academic and social pressures. Research has underscored the significance of resilience in coping with adversity (Werner, 1993) and attaining academic success

(Dweck, 2006). Resilience-building strategies include speaking positively to oneself, creating goals, taking care of oneself, looking for support systems and accepting difficulties. Resilience mitigates anxiety and depression in adolescents, acting as a protective factor (Werner, 1993). Developing resilience skills has been shown to help high school students cope with academic stress and anxiety (Fletcher & Sarkar, 2013). Moreover, the association between mindfulness and anxiety among adolescents has been revealed to be mediated by resilience (Kuyken et al., 2016). The combination of mindfulness and resilience training was found to foster mental health outcomes in adolescents. MBI enhance resilience, leading to reduced anxiety and stress among high school students (Harrison et al., 2017). Similarly, the combination of mindfulness, resilience and self-compassion has been associated with lower anxiety levels in high school students (Neff & McGehee, 2010).

Nevertheless, anxiety remains a significant concern among high school students. Studies have revealed that 1 in 5 students experience anxiety disorders (Merikangas et al., 2010), with 60% reporting feelings of overwhelm (American Psychological Association, 2014) and 45% experiencing exam-related anxiety (Putwain, 2007). The repercussions of anxiety can be severe, leading to impaired academic performance, social withdrawal, emotional distress and physical symptoms.

Also, extensive research indicates that mindfulness practices can effectively alleviate symptoms of anxiety and depression in adolescents (Zoogman et al., 2015). MBI have demonstrated a reduction in anxiety and improvement in emotional regulation among high school students (Hofmann et al., 2010). Additionally, regular mindfulness practice has been linked to enhanced cognitive functioning, leading to reduced anxiety and stress (Zeidan et al., 2010). Effective interventions for promoting mindfulness and resilience in high school students include Mindfulness-Based Stress Reduction (MBSR) programs (Biegel et al., 2009), school-based mindfulness and resilience interventions (Harrison et al., 2017). These interventions have shown promise in reducing anxiety and improving mental health outcomes in adolescents. By integrating mindfulness and resilience training into educational settings, educators can equip

students with essential tools for managing anxiety and promoting overall well-being.

3. EXISTING RESEARCH AND GAPS IN KNOWLEDGE

MBIs have demonstrated the ability to mitigate anxiety and foster resilience in adolescents, who suffer from anxiety, a common problem that affects higher secondary school students worldwide and has an influence on their mental health academic performance and general well-being. Studies consistently demonstrate that MBI effectively reduces anxiety and depression in adolescents (Zoogman et al., 2015). Mindfulness practices have also been found to improve resilience, self-esteem and emotional regulation in this demographic (Hofmann et al., 2010). Additionally, school-based mindfulness programs have been shown to enhance mental health outcomes and alleviate signs of depression and anxiousness (Harrison et al., 2017). Furthermore, the optimal duration and frequency of mindfulness practices for adolescents require additional study (Crane et al., 2017). The researcher chose to explore MBI for alleviating anxiety in high school students due to the particular vulnerability of this population to anxiety and stress. As students navigate significant academic, social and emotional changes, effective tools are essential for managing their mental health. MBI offer a promising approach to promoting resilience, reducing anxiety and enhancing overall well-being.

4. SIGNIFICANCE OF THE STUDY

The study delves into the correlation between mindfulness and resilience, shedding light on effective strategies to bolster the emotional and academic well-being of adolescents. It is crucial to address the mounting concerns regarding mental health, particularly anxiety and stress, among high school students as these issues significantly impact their academic performance, social interactions and overall welfare (WHO, 2019). "Research indicates that MBI holds promise in alleviating symptoms of depression and anxiety" (Hofmann et al., 2010). "The insights gleaned from this study will serve to guide educators, policymakers and stakeholders, emphasizing the advantages of incorporating mindfulness into school curricula to foster a supportive learning environment" (Zenner et al.,

2014). There is still a dearth of empirical evidence on mindfulness's effects on resilience and anxiety in adolescence, despite the growing interest in the practice, underscoring the need for more study.

This research offers valuable insights into the development of evidence-based interventions aimed at enhancing student resilience (Werner, 1993). Additionally, mindfulness practices can also benefit teachers by improving their well-being and effectiveness in the classroom (Flook et al., 2013). Cultivating mindfulness and resilience in adolescence can yield long-term benefits, equipping students with the necessary skills to navigate future challenges (Masten, 2001). The research highlights the crucial importance of MBI in addressing the growing mental health challenges, lessening anxiety, building resilience and promoting overall well-being among high school students. By exploring the connection between mindfulness and resilience, this study makes a valuable contribution to existing knowledge and informs effective strategies to help adolescents thrive emotionally, socially and academically.

5. OBJECTIVES OF THE PRESENT STUDY

- To measure the anxiety level among higher secondary students in control and experimental groups before (pre-test) and after (post-test) the interventions.
- To measure the resilience level in control and experimental groups before (pre-test) and after (post-test) the MBI.
- To determine whether the MBI have a significant impact by comparing post-test anxiety levels between the control and the experimental groups.
- To determine whether the MBI have a significant impact by comparing post-test resilience levels between the control and the experimental groups.
- To determine whether the MBI have a significant impact by comparing the pre-test to the post-test within the experimental group in terms of anxiety level.
- To determine whether the MBI have a significant impact by comparing within the experimental group from pre-test and post-test in terms of resilience level.

6. HYPOTHESES OF THE PRESENT STUDY

- The study expects to measure the anxiety level among higher secondary students in control and experimental groups before (pre-test) and after (post-test) the interventions.
- The study expects to measure the resilience level among higher secondary students in control and experimental groups before (pre-test) and after (post-test) the interventions.
- The study expects no significant impact by comparing post-test anxiety levels between the control and the experimental groups.
- The study expects no significant impact by comparing post-test resilience levels between the control and the experimental groups.
- The study expects no significant impact by comparing the pre-test to the post-test within the experimental groups in terms of anxiety level.
- The study expects no significant impact by comparing the experimental groups from the pre-test to the post-test in terms of resilience level.

7. METHODOLOGY OF THE PRESENT STUDY

The present study aims to explore the impact of mindfulness on anxiety and resilience among higher secondary students in and around Karaikudi. The study population consisted of students from various schools in the Karaikudi area. 60 students were selected as a sample, evenly divided into control and experimental

groups, Eleventh Standard Students from Alagappa Model Higher Secondary School, Karaikudi, by using a convenience sampling method. Here, Mindfulness was treated as the independent variable, while anxiety and resilience were treated as the dependent variables.

This study utilized an experimental pre-test and post-test control group framework, by employing a parallel group design. Participants were randomly assigned to either the control group or the experimental group. The present research is to investigate how mindfulness affects higher secondary students' anxiety and resilience in and around Karaikudi. Using convenience random sampling, 60 students from Alagappa Model Higher Secondary School in Karaikudi were chosen as a sample and split equally into control and experimental groups. Before the MBI, the Pre-test assessments of anxiety and resilience were conducted for both groups. After conducting the pre-test, MBI was conducted for 8-weeks. Following the MBI post-test were conducted to evaluate the effectiveness of MBI in reducing anxiety levels and increasing resilience levels among higher secondary students. This design enabled an investigation into the causal relationship between mindfulness and its effects on anxiety and resilience.

By using this methodology, the study intended to provide insightful knowledge on how well MBI to improve resilience level and to lower anxiety level within higher secondary students.

8. DATA ANALYSIS:

Hypothesis-1:

The study expects to measure the anxiety level among higher secondary students in control and experimental groups before (pre-test) and after (post-test) the interventions.

Table-1: Shows the level of anxiety level among higher secondary students in control and experimental groups before (pre-test) and after (post-test) the interventions

Level	Pre-Test		Post-Test	
	Experimental	Control	Experimental	Control
Moderate	3	6	12	7
High	10	9	4	13
Severe	17	15	0	10
Low	0	0	14	0
Total	30	30	30	30

The data presented in the table indicates that the experimental group achieved notable progress. Specifically, there is a complete elimination of severe cases, decreasing from 17 to 0 and a significant

increase in low-level performance, rising from 0 to 14. Additionally, moderate cases experienced a marked increase from 3 to 12, suggesting improved outcomes for students who were previously categorized as severe. Conversely, high-level cases decline from 10 to 4, which may imply a redistribution of students to low and moderate performance levels. In comparison, the control group showed minimal progress. Severe cases show a slight reduction from 15 to 10, while high-level cases increase from 9 to 13. Moderate cases experience a small decline, changing from 6 to 7 and there is no change in low-level performance, which remained at 0 throughout the study. Furthermore, the level of anxiety of both the control group and experimental group is Severe in the Pre-Test, the level of anxiety of the Control Group is high and that of the Experimental Group is Low in the Post-Test.

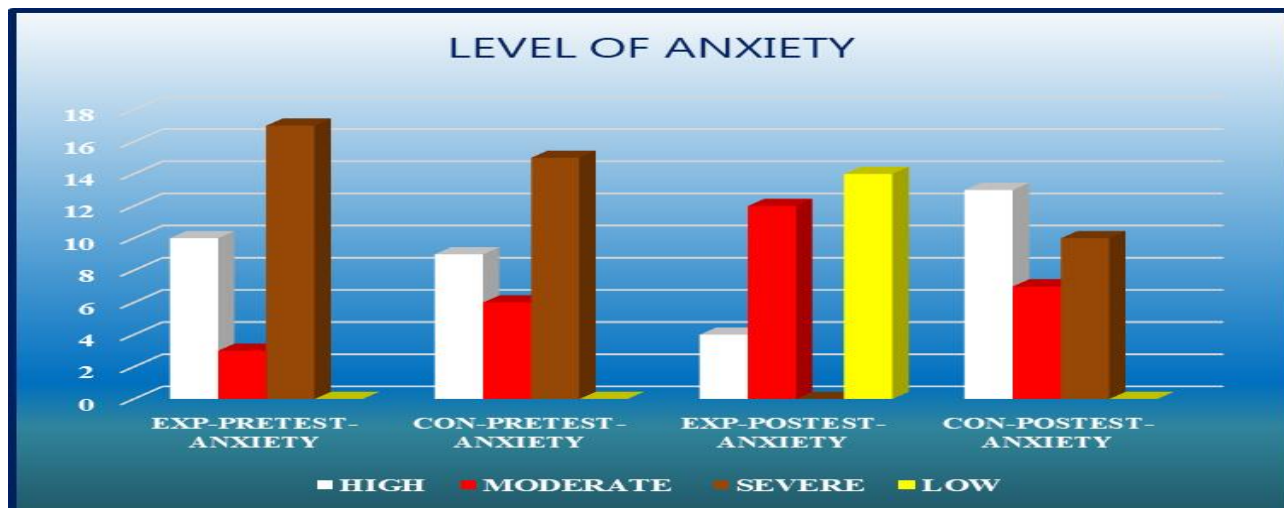


Figure-1: Shows the level of anxiety among higher secondary students in control and experimental groups before (pre-test) and after (post-test) the interventions

Hypothesis-2:

The study expects to measure the resilience level among higher secondary students in control and experimental groups before (pre-test) and after (post-test) the interventions.

Table-2: Shows the level of resilience among higher secondary students in control and experimental groups before (pre-test) and after (post-test) the interventions

LEVEL	PRE-TEST		POST-TEST	
	Experimental	Control	Experimental	Control
Moderate	4	4	10	5
High	9	9	15	9
Low	17	17	5	16
Total	30	30	30	30

The experimental group exhibited a notable improvement in resilience levels from the pre-test to the post-test. Cases of high resilience saw a substantial increase from 4 to 10, while moderate resilience cases rose from 9 to 15. Significantly, cases of low resilience decreased dramatically from 17 to 5, underscoring the effectiveness of the intervention in enhancing resilience levels. In contrast, the control group experienced only marginal changes. High resilience cases saw a slight increase from 4 to 5 and moderate resilience cases remained stable at 9. The low resilience cases experienced a minimal reduction from 17 to 16, indicating limited improvement without the intervention. This comparison underscores the substantial positive impact of the experimental intervention on resilience levels when contrasted with the control group. Furthermore, the level of resilience of both the control group and experimental group is Low in the Pre-Test, the level of resilience of the Control Group is Low and that of the Experimental Group is Moderate in the Post-Test.



Figure-2: Shows the level of resilience among higher secondary students in control and experimental groups before (pre-test) and after (post-test) the interventions

Hypothesis-3:

The study expects no significant impact by comparing post-test anxiety levels between the control and the experimental groups.

Table-3: Shows the significant impact of post-test anxiety levels between the control and the experimental groups

S.NO	GROUP	N	MEAN	SD	t-value	df	REMARK
1	Control	30	55.97	10.08	8.90	58	Significant
2	Experimental	30	33.50	9.46			

(At 0.05 level of significance, the table value of 't' is 1.671)

From the above table, as the calculated value (8.90) is greater than the table value (1.671), it is inferred that there is a significant difference in anxiety levels between the experimental and control groups at the post-test. Therefore, the null hypothesis is rejected.

Hypothesis-4:

The study expects no significant impact by comparing post-test resilience levels between the control and the experimental groups.

Table-4: Shows the significant impact of post-test resilience levels between the control and experimental groups

S.NO	GROUP	N	MEAN	SD	t-value	df	REMARK
1	Control	30	41.33	4.20	7.28	58	Significant
2	Experimental	30	54.13	8.66			

(Table value of 't' at the 0.05 level of significance is 1.671)

From the above table, the computed value (7.28) is higher than the table value (1.671). It can be inferred from the table that there is a significant impact on the resilience levels of the experimental and control groups at the post-test. Therefore, the null hypothesis is rejected.

Hypothesis-5:

The study expects no significant impact by comparing the pre-test to the post-test within the experimental groups in terms of anxiety level.

Table-5: Shows the significant impact by comparing the pre-test within the experimental groups in terms of anxiety level

S.NO	TEST	N	MEAN	SD	t-value	df	REMARK
1	Pre-Test	30	60.57	9.73	10.92	58	Significant
2	Post-Test	30	33.50	9.46			

(Table value of 't' at the 0.05 level of significance is 1.671)

Based on the preceding table, the null hypothesis is rejected. Because the calculated value (10.92) is greater than the table value (1.671). It is concluded that there is a significant impact by comparing the pre-test to the post-test within the experimental groups in terms of anxiety level.

Hypothesis-6:

The study expects no significant impact by comparing the experimental groups from the pre-test to the post-test in terms of resilience level.

Table-6: Shows the significant impact by comparing the experiment groups from the pre-test to the post-test in terms of resilience level

S.NO	TEST	N	MEAN	SD	t-value	df	REMARK
1	Pre-Test	30	40.93	4.98	7.24	58	Significant
2	Post-Test	30	54.13	8.66			

(Table value of 't' at the 0.05 level of significance is 1.671)

From the above table, the table value (1.671) is lower than the calculated value (7.24), indicating that the experimental group's anxiety levels differed significantly between the pre-test and the post-test. The null hypothesis becomes invalidated.

9. FINDINGS

The study found substantial results in the investigation of anxiety and resilience levels among higher secondary students.

9.1. Anxiety Levels:

The experimental group significant decreases in anxiety levels between the pre-test and post-test stages. The severe level of anxiety among higher secondary students decreased from seventeen to zero, in the meantime the low level of anxiety increased from zero to fourteen. This proved that the effectiveness of MBI alleviated anxiety among higher secondary students. By comparing the control group showed less progress by a small change in the severe level of anxiety from fifteen to ten and the low level of anxiety remains constant among higher secondary students. When compared to the control group, the experimental group's anxiety level significantly decreased in the post-test.

9.2. Resilience Level:

The control group showed minor changes, the number of high-level resilience among higher

secondary students slightly increased from four to five and their low level of resilience dropped considerably from seventeen to sixteen. In contrast, the experimental group demonstrated notable progress in resilience levels. Because the high level of resilience among higher secondary students increased from four to ten, also moderate level of resilience grew from nine to fifteen and the low resilience level reduced considerably from seventeen to five. Therefore, at the post-test, the experimental group exceeds the control group in addressing resilience.

9.3. Pre-test vs. Post-test in the Experimental Group:

Anxiety levels in the experimental group reduced considerably from the pre-test to the post-test by indicating the effectiveness of MBI in lowering anxiety. Furthermore, the experimental group's resilience levels considerably increased from the pre-test to the post-test, suggesting the beneficial effect of MBI in increasing resilience.

9.4. Control Group Outcomes:

Resilience and anxiety levels in the control group were hardly boosted, highlighting the necessity of structured interventions like mindfulness to achieve meaningful progress in mental health outcomes. These findings provide strong evidence supporting the integration of mindfulness practices into educational settings to improve mental well-being, reduce anxiety and foster resilience among higher secondary school students.

10. DISCUSSIONS

The result of this study showed how MBI can significantly alleviate anxiety and boost resilience in higher secondary students. The study demonstrated the efficiency of the interventions by revealing significant changes between the experimental and control groups using a pre-test and post-test experimental framework.

10.1. Anxiety Levels:

After the MBI, the experimental group's anxiety levels significantly decreased. Severe cases of anxiety were eliminated, resulting in a notable shift toward low and moderate anxiety levels. This finding is consistent with existing literature (Hölzel et al., 2011; Zoogman et al., 2015), which underscores the efficacy of mindfulness practices in alleviating anxiety symptoms. In contrast, the control group exhibited minimal improvements, suggesting that the absence of intervention left anxiety levels close to baseline values. "The results of the t-test supported these findings, showing that the experimental and control groups' anxiety levels differed significantly at the post-test ($t=8.90, p<0.05$). This highlights the transformational power of mindfulness in lowering anxiety, which has been demonstrated in earlier research" (Hofmann et al., 2010; Zeidan et al., 2010).

10.2. Resilience Levels:

The experimental group demonstrated significant improvements in resilience levels, with a marked increase in cases of high and moderate resilience and a substantial decline in low resilience cases. This aligns with research by Werner (1993), which suggests that mindfulness fosters essential components of resilience, such as emotional regulation, adaptability and problem-solving. The control group, however, exhibited

negligible changes in resilience levels, highlighting the necessity of targeted interventions. Further supporting the beneficial effects of mindfulness on resilience development, the t-test analysis showed a significant difference in resilience levels between the experimental and control groups at the post-test ($t=7.28, p<0.05$).

10.3. Pre-test to Post-test Comparisons in the Experimental Group:

From the pre-test to the post-test, the experimental group showed significant increases in resilience ($t=7.24, p<0.05$) and significant decreases in anxiety ($t=10.92, p<0.05$). These findings underscore the effectiveness of mindfulness practices in fostering emotional and cognitive growth among adolescents.

11. CONCLUSION

The effectiveness of MBI in reducing anxiety and building resilience in higher secondary students is convincingly demonstrated by the present research. The mindfulness intervention effectively reduced anxiety levels, transitioning students from severe to low and moderate anxiety categories. This outcome highlights the potential of mindfulness as a non-invasive and accessible tool for alleviating adolescent anxiety. Furthermore, the intervention significantly improved resilience levels, equipping students with essential skills to navigate challenges and adapt to adversity. This finding emphasizes the role of mindfulness in promoting emotional well-being and academic success. Integrating mindfulness practices into school curricula can serve as a proactive approach to mental health management. Educators and policymakers should consider implementing structured mindfulness programs to address the growing prevalence of anxiety and enhance resilience among students. The present research bridges gaps among resilience, mindfulness and adolescent mental health by adding to the body of knowledge already in existence. The findings support theoretical frameworks that emphasize the interconnection between mindfulness, emotional regulation and resilience. Regular mindfulness practices, such as breathing exercises, body scans and reflective journaling should be encouraged among students. Additionally, teacher training programs focused on mindfulness can amplify the benefits for both educators and

learners. In summary, MBI hold immense potential for transforming the mental health landscape for adolescents. By fostering resilience and alleviating anxiety, these practices empower students to thrive academically, emotionally and socially, paving the way for a healthier and more resilient generation.

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