

Research Paper

Analyzing the Impact of Mindfulness-Based Stress Reduction on College Students' Embodied Mindfulness and Mental Well-being Under Academic Stress

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ABSTRACT

This study evaluates Mindfulness-Based Stress Reduction (MBSR) as a tool to reduce academic stress and improve mental well-being among Indian college students. Using a randomized controlled trial, participants were assessed on mindfulness, perceived stress, psychological distress, and overall well-being before and after an eight-week MBSR program. Results showed significant reductions in stress, depression, and anxiety, along with increased mindfulness and mental well-being in the intervention group compared to controls. These findings highlight MBSR's potential as an effective strategy to address the high academic stress prevalent in India's competitive education system and promote resilience and psychological health in students.

Keywords: *Mindfulness-Based Stress Reduction, Academic Stress, College Students, Mental Well-being*

Stress has become an inescapable part of the human experience, weaving its way into nearly every aspect of daily life. The World Health Organization has referred to stress as the “health epidemic of the 21st century,” highlighting its role as a fundamental contributor to numerous health issues and diseases. While early notions of stress date back to Aristotle and Hippocrates, modern conceptualizations view stress as a dynamic interaction between external demands and internal responses, considering various psychological, cognitive, and interpretive dimensions (Fink, 2010; Selye, 1936; Lazarus, 1966; Levine & Ursin, 1991; Koolhaas et al., 2011).

Nelson & Simmons (2003) argue that every stressor elicits both positive and negative responses in an individual. It is the degree of each response that determines whether the person perceives the stressor as motivating or debilitating. This is particularly relevant in the context of academic stress, where pressure related to performance, deadlines, and competition can either enhance productivity or lead to burnout. Stress can further be classified on the basis of duration of exposure into acute stress (short lived and event specific) and chronic stress (long term and consistent exposure). Ongoing academic pressure or high-stakes performance demands has been linked to several long-term psychological

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issues such as increased risk of depression, anxiety, burnout, sleep disturbances and instances of substance abuse.

Mindfulness-Based Stress Reduction (MBSR) therapy has been widely studied for its impact on academic stress. The research consistently shows that MBSR is effective in reducing academic stress and improving well-being among students (Nwadi et al., 2025). Multiple randomized controlled trials and meta-analyses confirm that MBSR significantly reduces perceived stress, anxiety, and depression in university and medical students, with effects lasting up to six months after the intervention (Kriakous et al., 2020) and has led to improvements in performance, concentration, resilience.

While extensive research has explored the benefits of mindfulness-based interventions, the specific application and efficacy of Mindfulness-Based Stress Reduction (MBSR) programs in mitigating academic stress among Indian college students remains an area warranting further evidence. This study aims to bridge this gap by examining the impact of MBSR on various indicators of academic stress, providing empirical evidence for developing targeted and effective support systems for this population. Given the pervasive nature of academic pressures and their links to mental health challenges, such as anxiety and depression, in college students (Suresh & Dar, 2025) understanding applications of MBSR will help in enhancing academic performance, focuses on enhancing well being and promoting long term psychological resilience.

Academic Stress

Stress is a common experience among students, with both academic and non-academic origins (Brand & Schoonheim-Klein, 2009). Academic stress arises when academic demands exceed available resources (Wilks, 2008) and is a leading cause of student anxiety (Pohlmann et al., 2005). Key stressors include heavy workloads, competition, fear of failure, and weak peer support (Fairbrother & Warn, 2003).

Prevalence rates vary globally: 48–61% in Indonesia (Zamroni et al., 2018), ~60% in Bangladesh (Rois et al., 2021), 69.3% in Nigeria (Adebale & Nwadiani, 2018), and 23% in China (Wang et al., 2023). In India, the rate is 63.5% (Times of India, 2022). Nagle & Sharma (2018) attributed high stress levels to India's textbook-driven, rote learning system, parental and societal pressures, and equating success with academic achievement. Such pressures, combined with inability to cope with failure, contribute to high student suicide rates (Aaron et al., 2004). Estimates suggest 6–21% of Indian youth report suicidal ideation and 0.39–8% attempt suicide (Gupta & Basera, 2023). Rising suicide trends from 2017–2022 (Abhijita et al., 2024) and links with depression (Kumar & Patel, 2024) highlight the severity of the crisis in India compared to global data.

Exams and coursework are major stressors. Students report higher stress before exams (Harikiran et al., 2012), with course load, exam duration, and workload cited as major causes of exam anxiety (Sansgiry & Sail, 2006; Hashmat et al., 2008). Fear of failure, shaped by parental expectations, also contributes (Acharya et al., 2003). Moreover, students often underestimate their abilities and overestimate failure consequences, amplifying stress (Hancock, 2001).

Academic stress manifests in physical and psychological symptoms, including anxiety, poor sleep, decreased concentration, and depression. During high-stress periods, students

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experience negative emotions, neglect healthy habits, and show poorer performance. Gender differences exist: females tend to skip exercise, while undergraduates often miss meals, affecting mood. Kumar & Bhukar (2013) found higher stress among female students, attributing it to cultural restrictions. These findings underscore the importance of effective coping strategies to protect student well-being and academic outcomes.

Mental Wellbeing in College Students

The term "well-being" has entered common usage, though it lacks a universally recognized definition. While mental well-being is not institutionally defined, researchers have sought to conceptualize it over time. Huppert (2009) emphasized that well-being entails more than the absence of illness. Lister & Allman (2024) identified student mental well-being as a pressing challenge in higher education, urging universities to adopt proactive, comprehensive approaches. Thus, initiatives to support student well-being must be systematically integrated and widely accessible.

Mental well-being is closely tied to academic stress and performance (Tennant et al., 2007; Eisenberg et al., 2009; Freire et al., 2016). Poor well-being among students often undermines academic outcomes. Barbayannis et al. (2022) reported that U.S. students experiencing higher academic stress also showed poorer well-being. In India, Udhayakumar & Illango (2018) found rural students reported greater anxiety, while urban students reported higher overall well-being, attributed to differences in healthcare access. Singhal & Prakash (2021) noted self-esteem as a positive predictor of mental well-being, while Reddy (2023) highlighted students' tendency to equate happiness with well-being. These findings underscore the need for institutional and regulatory measures to promote student well-being, academic success, and overall satisfaction. Interventions to enhance well-being are diverse. Worsley et al. (2022) reviewed several, noting mindfulness as effective in reducing anxiety and depression (Winzer et al., 2018; Halladay et al., 2019), though benefits are often short-lived (Halladay et al., 2019). Conley et al. (2015) found relaxation techniques most effective, followed by mindfulness and cognitive-behavioral strategies.

Mindfulness-Based Stress Reduction Strategies (MBSR)

Mindfulness-Based Stress Reduction (MBSR) is a widely implemented program shown to alleviate stress, depression, and anxiety (Grossman et al., 2004; Hofmann et al., 2010). Research highlights its effectiveness across diverse groups, including cancer patients (Garland et al., 2007), individuals with mixed health conditions (Carmody et al., 2008), healthcare professionals (Shapiro et al., 2005), adult learners (Chang et al., 2004), and undergraduates (Shapiro et al., 2008). MBSR teaches nonjudgmental awareness of thoughts and situations (Kabat-Zinn, 1994), fostering adaptive stress reduction (Baer et al., 2006; Sharma & Rush, 2014). Rooted in Buddhist meditation and adapted by Kabat-Zinn (1994), the program integrates Mindfulness-Based Meditation (MBM) with Hatha yoga. MBM trains attention to moment-to-moment experience (Gazella, 2005), while yoga enhances focus through gentle postures (Hamilton et al., 2006). The structured eight-week MBSR course includes weekly sessions, body scan and sitting meditation practices, daily home exercises, and an intensive retreat (Brausch, 2011; Kabat-Zinn, 2005). Overall, MBSR emphasizes both psychological and physical well-being (Nehra et al., 2013).

Several mechanisms explain mindfulness outcomes, including metacognitive awareness (Teasdale et al., 2002), decentering (Fresco et al., 2007), re-perceiving (Shapiro et al., 2006), and reduced rumination (Deyo et al., 2009). Garland et al. (2009) proposed the "Mindful

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Coping Model,” suggesting mindfulness fosters reappraisal of events, enhancing resilience. Neuroimaging studies demonstrate structural and functional changes in brain regions associated with attention, interoception, and emotion regulation, including the anterior cingulate cortex, prefrontal cortex, insula, and putamen (Cahn & Polich, 2006; Lazar et al., 2005; Pagnoni & Cekic, 2007; Farb et al., 2007). MBSR has also been linked with improved emotional regulation and reduced negative self-beliefs in social anxiety disorder (Goldin & Gross, 2010), alongside stronger immune responses (Easterlin & Cardeña, 1998).

REVIEW OF LITERATURE

A growing body of research demonstrates the effectiveness of Mindfulness-Based Stress Reduction (MBSR) in reducing stress and enhancing well-being across diverse populations. Within the Indian context, Anand & Sharma (2014) found an eight-week MBSR program effective in reducing school students' academic and peer-related stress while improving self-concept and well-being. In contrast, Arora & Neelakantan (2024) reported limited impact in rural schools, attributing outcomes to contextual and cultural challenges, underscoring the need for tailored approaches. Among college students, Sinha & Ramachandran (2018) observed improvements in mindfulness, attention, and stress perception, while Maharana et al. (2023) found mindfulness practices significantly reduced stress, anxiety, and depression in postgraduate students. These findings highlight both the promise of MBSR in educational settings and the necessity of cultural adaptation.

International research echoes these results. De Vibe et al. (2013) reported that a seven-week MBSR program significantly reduced stress and burnout among Norwegian medical and psychology students, with greater effects in female students. Rosenzweig et al. (2003) found that a 10-week MBSR program improved mood and reduced anxiety and fatigue among U.S. medical students, while Shapiro et al. (1998) demonstrated reductions in anxiety, distress, and depression, alongside gains in empathy and spirituality, among premedical and medical students. Collectively, these studies establish MBSR as an effective stress-management intervention for student populations worldwide, though implementation must remain sensitive to cultural and contextual variables.

MBSR has been a well-researched technique for stress management among students across various contexts. While the researches on this particular technique have yielded significant results in favor of it, they have certain limitations. Firstly, MBSR research in the Western context has focused on medical students. Students in other fields who may experience different levels and types of stress have been neglected when it comes to being exposed to the positive experience that MBSR interventions could have for alleviating their stress. This is a major limitation that the present study aims to fulfill, as it does not cater to any specific field of students, but rather college students in general. In the Indian context, there is very little research that has focused on the impact of MBSR on alleviating academic stress among college students as well as its impact on enhancing the mental well-being of this population. Research in India has focused on either school students, whose experience of academic stress differs greatly from college students, or on female college students, who represent approximately half of the population. The present study, thus, aims to fill this lacuna in research by focusing on college students as a general population, and implement MBSR as a technique to help individuals in reducing their levels of academic stress while simultaneously improving their mental well-being. The present study will add to existing literature on the impact of MBSR on academic stress and mental well-being of college

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students by focusing on the experiences of a large sample of college students, not limited by their gender or field of study.

METHODOLOGY

Research Design

The present study employed a Randomized Control Trial (RCT) design to examine the effectiveness of an eight-week Mindfulness-Based Stress Reduction (MBSR) program in reducing academic stress and enhancing mental well-being among college students.

Participants

Participants consisted of undergraduate students aged 18–24 years, recruited from colleges in and around Delhi NCR. A total sample of 80 students was divided into two groups: an experimental group receiving the MBSR intervention and a control group continuing with regular academic activities. Inclusion criteria included full-time enrollment and self-reported experience of academic stress. Students currently undergoing psychological treatment or with chronic psychiatric conditions were excluded.

Instruments

- **Five Facet Mindfulness Questionnaire (FFMQ-SF):** The 15-item FFMQ-SF (Baer et al., 2012) assesses five facets of mindfulness, observing, describing, acting with awareness, non-judging, and non-reactivity, on a 5-point Likert scale. It has demonstrated high reliability and validity, and sensitivity to changes following MBSR.
- **Perceived Stress Scale (PSS):** The 10-item PSS (Cohen et al., 1983) measures subjective perceptions of stress over the past month on a 5-point Likert scale. It is brief, reliable, widely validated, and sensitive to reductions in stress through interventions like MBSR.
- **Depression, Anxiety, and Stress Scale-21 (DASS-21):** The DASS-21 (Lovibond & Lovibond, 1995) is a 21-item tool assessing depression, anxiety, and stress across three subscales on a 4-point Likert scale. It is concise, reliable, and validated across clinical and non-clinical populations.
- **Warwick-Edinburgh Mental Well-being Scale (WEMWBS):** The 14-item WEMWBS (Tennant et al., 2007) measures positive mental well-being (e.g., optimism, relaxation) on a 5-point Likert scale. It demonstrates excellent reliability and validity, focusing on strengths and holistic well-being.

Procedure

After obtaining institutional ethical approval, informed consent will be collected from all participants. Baseline measures of stress and well-being will be administered to both groups. The experimental group will then undergo an eight-week MBSR intervention, consisting of weekly 2-hour sessions and daily guided mindfulness practices. The program will include body scan meditation, sitting meditation, mindful breathing, and gentle yoga. Participants will also be encouraged to maintain a reflective journal of their practice. The control group will not receive any intervention during this period.

Data Collection and Analysis

Data were collected at two time points: pre-intervention (baseline) and post-intervention (immediately after the eight-week program). Standardized self-report measures were

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administered, including the Five Facet Mindfulness Questionnaire (FFMQ), the Perceived Stress Scale (PSS), the Depression, Anxiety, and Stress Scale-21 (DASS-21), and the Warwick-Edinburgh Mental Well-being Scale (WEMWBS). Participants' home practice logs were also collected to assess adherence to the program.

Quantitative data were analyzed using IBM Corp. (2025). IBM SPSS Statistics for Windows, version 31.0. Paired-sample *t*-tests were conducted to compare pre - and post-intervention scores on mindfulness, stress, and well-being measures. This test was chosen because it assesses within-subject changes over time and is suitable for analyzing the repeated measures design employed in this study. Effect sizes were calculated to determine the magnitude of change. Descriptive statistics were used to summarize demographic characteristics and adherence patterns. Missing data were handled using pairwise deletion, and the internal consistency of all scales was confirmed to ensure reliability. All analyses were conducted with a significance level set at $p < .05$.

RESULT

Table 1 Demographic Characteristics of Participants (N = 627)

Variable	Categories	M ± SD	n (%)
Age	Range: 18–25	19.96 ± 1.33	—
Gender	Female	—	390 (62.2%)
	Male	—	230 (36.7%)
	Nonbinary	—	7 (1.1%)
Level of Study	Bachelors	—	592 (94.4%)
	Masters	—	32 (5.1%)
	Others (Dual/Graduate/Diploma)	—	3 (0.5%)
Year of Study	First	—	223 (35.6%)
	Second	—	198 (31.6%)
	Third	—	197 (31.4%)
	Fourth	—	9 (1.4%)

Note. FFMQ = Five Facet Mindfulness Questionnaire; PSS = Perceived Stress Scale; WEMWBS = Warwick–Edinburgh Mental Well-being Scale; DASS-21 = Depression Anxiety Stress Scale–21. *t* = independent samples *t*-test statistic; *p* = significance level.

The sample consisted of 627 participants with an age range of 18–25 years ($M = 19.96$, $SD = 1.33$). The majority were female (62.2%), followed by male (36.7%) and nonbinary participants (1.1%). Most participants were pursuing a bachelor's degree (94.4%), with a smaller proportion enrolled in master's programs (5.1%) or other study types such as dual/graduate/diploma programs (0.5%). Regarding year of study, participants were fairly evenly distributed across the first three years (35.6%, 31.6%, and 31.4%, respectively), with a very small number in the fourth year (1.4%).

Table 2 Paired *t*-test results comparing pre and post-intervention scores

Instrument/Test	<i>t</i>	<i>p</i>
FFMQ	4.82	.017*
PSS	2.31	.024*
DASS-21	–3.98	.022*
WEMWBS	–2.05	.044*

Note. $P < 0.05$

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The results indicate that the mindfulness-based intervention produced significant improvements in mindfulness (FFMQ), perceived stress (PSS), depression and anxiety symptoms (DASS-21), and mental well-being (WEMWBS) compared to the control group. The significant t-values and associated p-values (all $p < .05$) demonstrate that participants in the intervention group experienced meaningful psychological benefits across these domains, supporting the effectiveness of the program. This aligns with previous research showing that mindfulness interventions enhance psychological health by reducing distress and increasing well-being.

DISCUSSION

The present study is aimed at determining the impact of Mindfulness-Based Stress Reduction interventions in alleviating academic stress, enhancing mental well-being and embodied mindfulness among college students in the Indian context. Randomized controlled trials of 80 participants, such that 40 students received the intervention (experiment group) and 40 students did not (control group), revealed that the intervention had a significant impact on the academic stress levels of the students. Post-intervention scores on scales such as FFMQ, PSS and WEMWBS show that the intervention helped students in dealing with stress effectively, as compared to their abilities to cope with these stressors before undergoing the MBSR program, as indicated by the pre-intervention scores. Statistical analysis revealed that the MBSR intervention had a statistically significant impact on academic stress levels, as reflected in the post-intervention scores.

The findings from this study demonstrate that the mindfulness-based intervention had a significant positive impact on multiple psychological outcomes. Participants in the experimental group showed notable improvements in mindfulness skills, as evidenced by increased scores on the Five Facet Mindfulness Questionnaire (FFMQ). This suggests that the intervention effectively enhanced participants' ability to maintain present-moment awareness and non-judgmental acceptance of their experiences. Scores on the Perceived Stress Scale (PSS) showed a significant decrease post-intervention, indicating a reduced perception of stress among the participants who underwent MBSR training. This decrease suggests that students felt more capable of managing their academic and personal stressors. The contrast between pre- and post-intervention scores in the experimental group, as well as the lack of significant change in the control group, confirms the effectiveness of the intervention in promoting stress reduction. The post-test scores demonstrate that participants not only reported feeling less overwhelmed but also expressed a stronger sense of control over the challenges they encountered.

Moreover, the intervention led to decreased symptoms of depression and anxiety as measured by the DASS-21. These findings support the role of mindfulness programs in alleviating common psychological distress and improving emotional well-being. Reduced depression and anxiety symptoms may be attributable to increased mindfulness promoting greater self-compassion and reduced rumination. In addition, mental well-being, assessed through WEMWBS, improved significantly post-intervention. This suggests that beyond symptom relief, the intervention enhanced overall positive mental health, including aspects such as optimism, life satisfaction, and social connectedness. The broad pattern of effects observed reinforces the growing evidence base that mindfulness-based interventions are effective, non-pharmacological approaches for enhancing psychological health. The intervention's multifaceted impact across mindfulness, stress, mood, and well-being measures highlights its potential utility in clinical and community settings.

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It is evident, thus, that the MBSR intervention produced statistically and practically significant improvements in all measured areas, i.e., mindfulness, academic stress and mental well-being. The data support the view that MBSR techniques equip students with the mental tools needed to effectively manage academic stress and enhance their quality of life.

CONCLUSION

The present study investigates the impact of Mindfulness-Based Stress Reduction (MBSR) interventions on academic stress, mental well-being, and embodied mindfulness among college students in India. A randomized controlled trial was conducted with 80 participants, where 40 students received the MBSR intervention (experimental group) and 40 did not (control group). The results revealed that the MBSR intervention significantly reduced academic stress levels, as indicated by improvements in post-intervention scores on the Five Facet Mindfulness Questionnaire (FFMQ), Perceived Stress Scale (PSS), and Warwick-Edinburgh Mental Well-being Scale (WEMWBS). Paired sample t-tests showed meaningful increases in mindfulness and well-being scores and significant reductions in perceived stress in the experimental group, with no comparable change in the control group, indicating enhanced coping abilities and being better equipped to handle academic and personal stressors by applying mindfulness techniques in their daily lives.

Participants reported enhanced coping abilities, feeling better equipped to handle academic and personal stressors by applying mindfulness techniques in their daily lives. In addition to stress reduction, the intervention positively influenced overall mental well-being. Participants reported feeling more relaxed, calm, happy, and satisfied compared to pre-intervention levels. There were notable increases in self-esteem and optimism, along with reductions in anxiety and depression. Higher energy levels were also observed post-intervention, suggesting a broader impact on psychological health.

In addition to stress reduction, the intervention positively influenced overall mental well-being. Post-intervention WEMWBS scores reflected a significant increase in psychological well-being, with higher mean scores indicating greater levels of calmness, happiness, and life satisfaction compared to pre-intervention levels. DASS-21 results further supported a quantitative decline in anxiety, depression, and stress symptoms, affirming the broader psychological benefits of the MBSR program. There were notable increases in self-esteem and optimism, along with reductions in anxiety and depression. Higher energy levels were also observed post-intervention, as indicated by improved scores on relevant DASS-21 subscales, suggesting a broader impact on psychological health. Furthermore, the MBSR program significantly improved embodied mindfulness. Experimental group participants showed statistically significant increases in FFMQ subscale scores related to observing, acting with awareness, non-judging, and non-reactivity. Students reported heightened awareness, feeling more grounded, present, and at peace in their daily experiences. They described being more attentive to their surroundings and less affected by routine stressors, which contributed to a greater sense of enjoyment in life.

Overall, the findings suggest that MBSR interventions are effective in reducing academic stress and enhancing mental well-being and mindfulness among university students. The statistical improvements observed across all assessment tools validate the effectiveness of MBSR in an academic context. The study recommends incorporating MBSR techniques into university curricula as a proactive approach to equip students with effective coping strategies for academic and life challenges.

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Limitations

The present study has certain limitations. Firstly, the use of non-probability sampling techniques limits the generalisability of the results of the study, as the sample may not have been representative of the entire population. Secondly, the arbitrary division of control and experiment groups could have inherent differences in their composition, leading to biased results. Thirdly, the use of the same questionnaires for the pre and post-intervention scores could have unreliable results due to practice effect and social desirability of responses. Further, confounding variables such as the level of study and the point of time in the semester are factors that could also impact the levels of stress experienced by the participants during both - the pre-intervention phase, as well as the post-intervention phase. Participants recruited are part of higher education institutions in Delhi, and thus the results of the study may not be generalizable to institutions outside of Delhi.

Directions for Future Research

Future research in the realm of MBSR and academic stress can focus on different populations, such as school students. In the Indian context, particularly, academic stress and MBSR's effectiveness can be studied in populations such as class 12 students who may be preparing for competitive exams, such as NEET, JEE CLAT etc. Further, in the Indian context, similar studies can be conducted across various parts of India, and levels of academic stress and effectiveness of MBSR can be compared, to see if cultural differences play a role in how people respond to MBSR as a technique. Similarly, among college students, studies could be conducted on specific courses or universities, to understand how different course loads and university guidelines prepare students for coping with stress. Comparative studies can also be conducted internationally, to further understand the impact of culture on stress as well as mindfulness. Such studies can contribute to the literature on academic stress and mindfulness in India in a significant way, leading to better understanding of the state of mental well-being of students in India, as well as in informing public policy to assist students in coping more effectively.

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