

Effect of Mindfulness-Based Interventions (Western and Indian Approaches) on Stress Reduction and Academic Performance in an Undergraduate Physiotherapy Student

Suresh. P. R

ABSTRACT:

Background: Undergraduate Bachelor of Physiotherapy (BPT) students are frequently exposed to high academic demands, making them vulnerable to stress that can adversely affect learning and academic performance. Students with persistent academic difficulties often experience heightened stress, reduced concentration, and low self-efficacy. Mindfulness-Based Interventions (MBIs), derived from both Western psychological models and Indian contemplative traditions, have shown promise in reducing stress and enhancing cognitive functioning, yet evidence in physiotherapy education remains limited. **Objective:** To evaluate the effect of an integrated Western and Indian Mindfulness-Based Intervention on perceived stress and academic performance in an undergraduate BPT student experiencing academic difficulties. **Methods:** A single-case study design was employed. Perceived stress was assessed using the Perceived Stress Scale (PPS), and academic performance was evaluated using marks obtained in three consecutive internal assessments. The participant underwent a 12-week structured MBI program incorporating Western mindfulness practices (mindful breathing, body scan, non-judgmental awareness) and Indian practices (Dhyana, Pranayama, mantra-based mindfulness, and Sakshi Bhava). **Results:** Post-intervention assessment revealed a substantial reduction in perceived stress scores, along with a progressive improvement in academic performance across three subsequent internal assessments. The findings suggest a positive association between stress reductions through mindfulness practices and enhanced academic outcomes. **Conclusion:** The integrated application of Western and Indian MBIs appears to be a feasible and effective non-pharmacological approach for reducing academic stress and improving academic performance in undergraduate physiotherapy students. Incorporation of mindfulness-based strategies within physiotherapy education may support student well-being and academic success.

KEYWORDS: Mindfulness-Based Interventions; Academic Stress; Physiotherapy Education; Undergraduate Students; Perceived Stress Scale; Academic Performance; Yoga and Meditation.

BACKGROUND:

Academic stress is a significant contributor to poor academic performance among undergraduate health-profession students. Learners who demonstrate persistent difficulty in understanding, retaining, and applying academic content often experience heightened stress, anxiety, and reduced self-efficacy. Mindfulness-Based Interventions (MBIs), rooted in both Western psychology and Indian contemplative

traditions, have shown promise in stress reduction and cognitive enhancement. However, limited case-based evidence exists in physiotherapy education.

Academic Stress in Undergraduate Physiotherapy Education:

Undergraduate health-professional education is academically demanding, requiring students to integrate theoretical knowledge with practical and clinical competencies. Among these programs, the Bachelor of Physiotherapy (BPT) curriculum is particularly intensive, encompassing subjects such as anatomy, physiology, biomechanics, pathology, and clinical physiotherapy from the early years of training. This rigorous academic structure, coupled with frequent assessments and high expectations for clinical competence, makes BPT students especially vulnerable to academic stress.

Academic stress refers to the psychological distress arising from academic demands perceived as exceeding an individual's adaptive capacity. Studies among physiotherapy and allied health students have consistently reported high levels of stress attributed to heavy academic workload, frequent examinations, fear of failure, time constraints, and pressure to perform clinically. BPT students often experience additional stress due to continuous internal assessments, viva examinations, and the need to demonstrate psychomotor skills alongside theoretical mastery.

Learners who exhibit persistent difficulty in comprehension, retention, and application of academic material — commonly described in educational settings as *slow learners*—are at an even greater risk of chronic academic stress. These students often report reduced self-esteem, examination anxiety, attentional difficulties, and avoidance behaviors. Prolonged academic stress in such learners has been associated with poor academic performance, absenteeism, burnout, and, in some cases, attrition from professional courses.

Research conducted among physiotherapy students in India and other countries has demonstrated a negative correlation between perceived stress levels and academic performance, with higher stress impairing concentration, working memory, and problem-solving abilities. Despite adequate intelligence and motivation, stress-related cognitive overload may significantly hinder academic success in undergraduate physiotherapy students.

Need for Non-Pharmacological Stress-Reduction Strategies in BPT Students:

Given the young age of undergraduate students and the academic nature of stress, non-pharmacological, preventive, and self-regulatory interventions are preferred. Conventional stress-management approaches such as counseling and academic mentoring, though beneficial, may not adequately address attentional control, emotional regulation, and cognitive flexibility required for sustained academic improvement. This has led to increased interest in Mindfulness-Based Interventions (MBIs) as an adjunctive educational and psychological support strategy.

Mindfulness-based approaches are particularly relevant in physiotherapy education, where students are trained to observe, analyze, and respond thoughtfully—skills that parallel the core principles of mindfulness practice.

Mindfulness-Based Interventions: Concept and Scope:

Mindfulness is broadly defined as the intentional, non-judgmental awareness of present-moment experiences, including thoughts, emotions, bodily sensations, and environmental stimuli. Mindfulness-Based Interventions aim to cultivate this awareness through structured practices, thereby enhancing attentional regulation, emotional balance, and stress resilience.

MBIs have gained substantial empirical support in educational and healthcare settings for reducing stress, anxiety, and depressive symptoms, while simultaneously improving concentration, working mem-

ory, and academic engagement.

Western Mindfulness-Based Interventions:

Western MBIs are primarily derived from Buddhist contemplative practices but have been secularized and standardized within psychological and clinical frameworks. The most widely recognized Western model is Mindfulness-Based Stress Reduction (MBSR), developed by Jon Kabat-Zinn.

Key components of Western MBIs include:

- Mindful breathing, which anchors attention to the present moment
- Body scan meditation, enhancing interoceptive awareness and relaxation
- Focused attention and open monitoring practices, promoting cognitive flexibility
- Non-judgmental observation of thoughts, reducing rumination and exam-related anxiety

In academic settings, Western MBIs have been shown to improve attention span, executive functioning, emotional regulation, and test performance. For undergraduate students, these practices help in recognizing stress responses early and responding adaptively rather than reactively.

Indian Mindfulness-Based Interventions:

India has a rich tradition of mindfulness and contemplative practices embedded within Yoga and Vedantic philosophy. Indian approaches to mindfulness emphasize self-awareness (*Atma Jnana*), attentional discipline (*Dharana*), meditation (*Dhyana*), and breath regulation (*Pranayama*).

Indian MBIs relevant to academic stress include:

- Dhyana (meditative awareness), fostering mental clarity and calmness
- Pranayama techniques such as Anulom Vilom and Bhramari, known to modulate autonomic balance and reduce physiological stress
- Mantra-based mindfulness, aiding sustained attention and emotional stability
- The concept of Sakshi Bhava (witness consciousness), which enables students to observe thoughts and emotions without identification or self-criticism

These practices are culturally familiar, cost-effective, and easily adaptable for Indian undergraduate students. Evidence suggests that yogic mindfulness practices improve cognitive processing speed, attention, emotional stability, and stress tolerance.

Integration of Western and Indian Mindfulness Approaches:

Integrating Western and Indian mindfulness approaches offers a comprehensive framework addressing both cognitive and emotional dimensions of academic stress. While Western MBIs emphasize structured attention training and cognitive awareness, Indian practices provide deeper emotional regulation and mind-body integration. Such a combined approach may be particularly effective for undergraduate physiotherapy students who experience sustained academic stress and performance difficulties.

Rationale for the present Case Study:

Despite growing evidence supporting mindfulness in higher education, there is limited case-based literature focusing on undergraduate physiotherapy students, particularly those with persistent academic difficulties. Furthermore, few studies have examined the combined application of Western and Indian mindfulness techniques using objective academic outcomes and validated stress measures.

Therefore, this case study aims to explore the effectiveness of integrated Mindfulness-Based Interventions in reducing perceived stress (measured using the Perceived Stress Scale) and improving academic performance (assessed through consecutive internal assessment marks) in a Bachelor of Physiotherapy student experiencing academic challenges.

OBJECTIVE:

To evaluate the effect of combined Western and Indian Mindfulness-Based Interventions on perceived stress levels and academic performance in an undergraduate Bachelor of Physiotherapy (BPT) student with consistently low academic achievement.

CASE DESCRIPTION:

A 19-year-old male undergraduate student enrolled in the Bachelor of Physiotherapy (BPT) program was identified by faculty as having persistent academic difficulties despite regular attendance and adequate effort. The student reported examination anxiety, poor concentration, fear of failure, and difficulty retaining theoretical concepts.

- Academic status: Below-average scores in previous internal assessments
- Psychological profile: High perceived academic stress, low confidence
- Inclusion criteria: No diagnosed psychiatric illness, not on psychotropic medication

Informed consent was obtained prior to intervention.

Outcome Measures:

1. Perceived Stress Scale (PPS) – used to assess stress levels
2. Internal Assessment (IA) Marks – used as an objective indicator of academic performance
 - Three consecutive internal assessments were recorded for comparison

Intervention Protocol:

The student underwent a 12-week structured Mindfulness-Based Intervention program, integrating both Western and Indian practices.

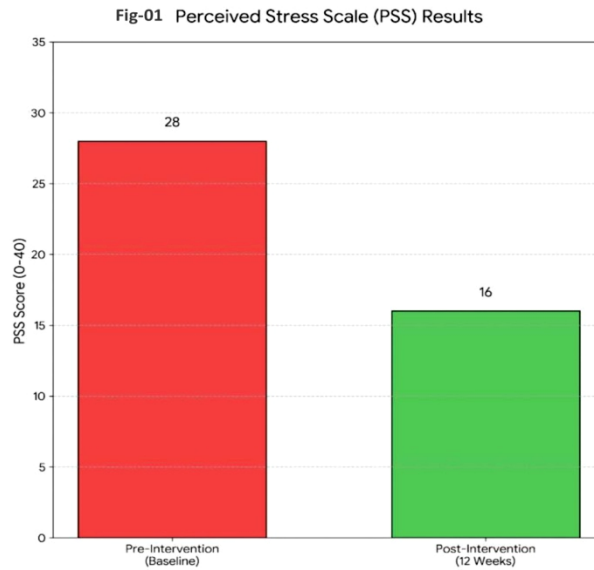
- **Western Mindfulness Components**
 - Mindful breathing awareness
 - Body scan meditation
 - Present-moment attention during study sessions
 - Non-judgmental observation of thoughts (adapted from MBSR principles)
- **Indian Mindfulness Components**
 - Guided Dhyana (meditation)
 - Pranayama (Anulom Vilom and Bhramari)
 - Short Mantra-based mindfulness before study periods
 - Yogic concept of Sakshi Bhava (observer attitude)

Frequency:

- 20–25 minutes/day
- 5 days/week
- Supervised weekly sessions with self-practice logs

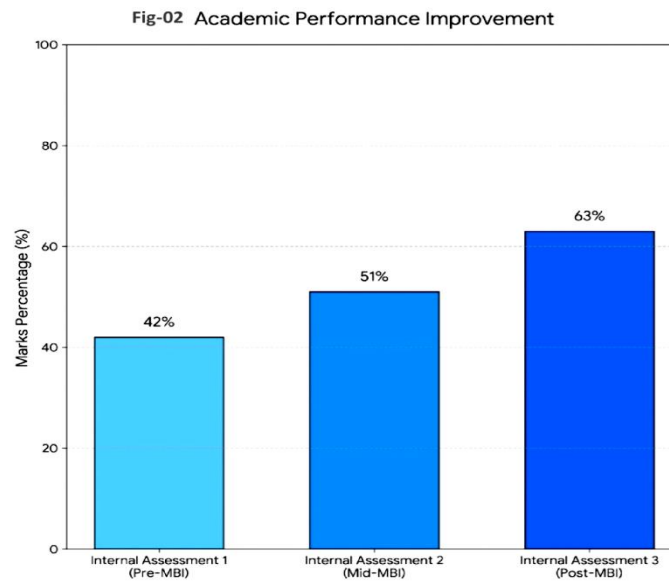
RESULTS:**Perceived Stress (PPS Score)**

- Baseline: High perceived stress (Score: 28)
- Post-intervention (12 weeks): Moderate stress (Score: 16)



Academic Performance (Internal Assessment Marks)

Internal Assessment	Marks (%)
IA-1 (Pre-MBI)	42%
IA-2 (Mid-MBI)	51%
IA-3 (Post-MBI)	63%



A progressive improvement was observed across three subsequent internal assessments, corresponding with a reduction in perceived stress.

DISCUSSION:

The present case study examined the effectiveness of an integrated Mindfulness-Based Intervention (MBI)—combining Western and Indian mindfulness practices—in reducing perceived academic stress and improving academic performance in an undergraduate Bachelor of Physiotherapy (BPT) student with persistent academic difficulties. The findings demonstrated a clinically meaningful reduction in

perceived stress scores alongside a progressive improvement in internal assessment marks across three consecutive evaluations.

Effect of Mindfulness on Academic Stress:

The significant reduction in the Perceived Stress Scale (PPS) score following the intervention aligns with existing literature reporting mindfulness as an effective tool for stress management among undergraduate and health-profession students. Multiple studies conducted among medical, nursing, and physiotherapy students have identified mindfulness practices as beneficial in reducing academic stress, examination anxiety, and emotional distress.

Previous research has shown that high academic stress adversely affects attention control, working memory, and executive functioning—key cognitive domains required for academic success in physiotherapy education. In the present case, the observed reduction in stress may be attributed to improved self-regulation, present-moment awareness, and emotional detachment from fear-based academic thoughts, as cultivated through mindfulness practices.

Indian yogic breathing techniques such as Anulom Vilom and Bhramari have been reported to enhance parasympathetic activity and reduce sympathetic over-arousal, which is commonly associated with chronic academic stress. This autonomic regulation may explain the participant's improved emotional stability and reduced physiological stress response during examinations.

Effect of Mindfulness on Academic Performance:

The gradual improvement in internal assessment scores across three subsequent evaluations suggests a positive association between reduced stress and enhanced academic performance. This finding is consistent with studies indicating that mindfulness improves attention span, cognitive flexibility, memory retention, and academic engagement.

Western mindfulness components such as mindful breathing, body scan, and non-judgmental observation of thoughts likely contributed to better concentration during lectures and study sessions. The practice of observing thoughts without emotional reactivity may have reduced performance anxiety and cognitive interference, allowing more efficient processing and recall of academic content.

Indian mindfulness practices, particularly Dhyana and the concept of *Sakshi Bhava* (observer attitude), may have played a crucial role in addressing the emotional and motivational dimensions of learning. These practices encourage acceptance, patience, and resilience, which are particularly important for students who have experienced repeated academic setbacks.

Similar findings have been reported in studies involving slow-progressing learners and academically vulnerable students, where mindfulness interventions led to improvements in test performance, class participation, and self-confidence.

Synergistic Effect of Western and Indian Approaches:

A notable strength of the present intervention is the integration of Western and Indian mindfulness traditions. Western MBIs provide structured, evidence-based cognitive strategies, while Indian practices offer culturally grounded, holistic mind-body regulation. The combined approach appears to have created a synergistic effect, addressing both the cognitive overload and emotional distress experienced by the student.

This integration may be particularly relevant in the Indian educational context, where culturally familiar practices enhance acceptability, adherence, and long-term sustainability of mindfulness programs.

Implications for Physiotherapy Education:

Physiotherapy education requires sustained attention, conceptual clarity, psychomotor learning, and clin-

ical reasoning. The findings of this case study suggest that mindfulness training can serve as a valuable adjunct to academic mentoring and remedial teaching programs. Incorporating structured mindfulness sessions within physiotherapy curricula or student support services may help reduce academic stress, enhance learning efficiency, and prevent burnout.

Suggestions:

Based on the findings of the present case study, the following suggestions are proposed:

1. Curriculum Integration: Short, structured mindfulness modules may be incorporated into undergraduate physiotherapy programs, particularly during the first and second academic years.
2. Early Identification and Support: Students demonstrating persistent academic difficulty should be identified early and offered mindfulness-based stress management as part of a comprehensive academic support strategy.
3. Faculty Training: Faculty members may be trained in basic mindfulness facilitation to integrate mindful practices during lectures, tutorials, and clinical teaching.
4. Combination with Academic Mentoring: Mindfulness interventions may be combined with study-skills training and mentoring to maximize academic outcomes.
5. Regular Monitoring: Periodic assessment of stress levels and academic performance should be conducted to evaluate long-term benefits.

Limitations:

Despite encouraging findings, the present case study has certain limitations:

1. Single-Case Design: the findings cannot be generalized to all BPT students.
2. Short-Term Follow-Up: Long-term sustainability of stress reduction and academic improvement was not assessed.
3. Self-Reported Stress Measure: Although the PPS is a validated tool, self-report measures may be influenced by subjective bias.
4. Confounding Academic Factors: Improvement in academic performance may also be influenced by increased familiarity with the syllabus or examination pattern.

Future research may focus on:

- Conducting randomized controlled trials involving physiotherapy students
- Comparing Western-only versus Indian-only versus integrated mindfulness interventions
- Exploring the long-term impact of mindfulness on clinical competence and professional well-being
- Including neurocognitive and physiological markers such as attention measures or heart-rate variability

The present case study supports the growing body of evidence that mindfulness-based interventions—especially when integrating Western and Indian approaches—can effectively reduce academic stress and improve academic performance in undergraduate physiotherapy students experiencing learning challenges. Such interventions offer a culturally adaptable, low-cost, and non-pharmacological strategy to enhance student well-being and academic success.

The findings suggest that combined Mindfulness-Based Interventions can effectively reduce academic stress and positively influence academic performance in undergraduate physiotherapy students. Indian mindfulness practices appeared particularly beneficial in emotional regulation, while Western techniques improved attention and study engagement. Reduced stress likely enhanced working memory, concentration, and exam confidence, contributing to improved academic outcomes.

CONCLUSION:

This case study demonstrates that an integrated Western and Indian Mindfulness-Based Intervention is a feasible and effective approach to reducing stress and improving academic performance in an undergraduate physiotherapy student facing academic challenges. Incorporating structured mindfulness programs within physiotherapy curricula may support student well-being and academic success.

Implications:

- Useful for student support and mentoring programs
- Can be integrated into foundation or remedial teaching modules
- Encourages non-pharmacological, culturally inclusive interventions in health education

REFERENCE:

1. Ostermann, T., et al. (2022). *The influence of mindfulness-based interventions on the academic performance of students: a systematic review and meta-analysis*. BMC Education / systematic review.
2. Zainal, N. H., et al. (2023). *Mindfulness enhances cognitive functioning: a meta-analysis of randomized trials*. Neuropsychologia / meta-analysis.
3. Gallo, G. G., et al. (2023). *A randomized controlled trial of an 8-week mindfulness intervention adapted for university students: effects on stress, anxiety, depression and insomnia*. International Journal of Mental Health Systems / RCT.
4. Kaisti, I., et al. (2023/2024). *The effects of mindfulness-based interventions in medical and health-professional students: a systematic review*. (Review article summarizing stress and well-being outcomes).
5. Shapiro, P., et al. (2019). *Mindfulness meditation for medical students: randomized pilot study and qualitative findings*. Medical Education / pilot RCT.
6. Damião Neto, A., Lucchetti, A. L. G., da Silva Ezequiel, O., et al. (2020). *Effects of a required large-group mindfulness meditation course on first-year medical students' mental health and quality of life: randomized controlled trial*. Journal of General Internal Medicine.
7. Dawson, A. F., et al. (2020). *Mindfulness-based interventions for university students: systematic review and meta-analysis*. Mindfulness (journal).
8. Sperling, E. L., et al. (2023). *The effect of mindfulness interventions on stress in medical students: a systematic review and meta-analysis*. PLOS ONE.
9. Villalba, M. J. A., et al. (2022). *Multilevel meta-analysis of school mindfulness-based programmes: cognitive and behavioral outcomes*. Clinical Child and Family Psychology Review / meta-analysis.
10. Ranjani, H., et al. (2023). *The impact of yoga on stress, metabolic parameters, and cognition (attention & concentration) in adolescents: an Indian multicity study*. BMC Public Health / quasi-experimental.
11. Tseng, A. A., et al. (2022). *Scientific evidence of health benefits by practicing mantra meditation: a narrative review*. Journal of Integrative Medicine / review.
12. Pangtey, R., et al. (2020). *Perceived Stress and its epidemiological and behavioral correlates: validation and use of the Perceived Stress Scale (PSS-10) in an Indian sample*. Indian Journal of Public Health / psychometric report.
13. Bordbar, S., et al. (2024). *The impact of mindfulness on academic achievement of university students: a controlled study*. BMC Medical Education / empirical study.

14. Küchler, A. M., et al. (2023). *A three-armed randomized controlled trial evaluating guided internet-based mindfulness (StudiCare-Mindfulness) for college students*. International Journal of Environmental Research and Public Health / RCT.
15. Modrego-Alarcón, M., et al. (2021). *Efficacy of a mindfulness-based programme for reducing stress in university students and mechanisms of action (including VR exposure feasibility)*. Behaviour Research and Therapy / controlled trial.
16. Roziqin, A., et al. (2024). *The Role of Mindfulness in Managing Academic Stress: Implications for Student Well-being and Mental Resilience*. *Education and Sociedad* (qualitative research on mindfulness reducing academic stress).
17. *Mindfulness and Yoga Based Practices for Reducing Stress...* (2025). *Indian Journal of Psychological Interventions* (review suggesting integration of mindfulness programs in university curricula reduces stress and anxiety).
18. *Role of Mindfulness Practices on Academic Stress of College Students* (2025). *International Journal of Innovative Research in Arts and Science* (eight-week mindfulness program significantly reduced academic stress).
19. Mahapatra, S. J., & Mahapatra, M. (2025). *Influence of Yoga on Mental Health Among University Students*. *Journal of Ayurveda and Integrative Medicine Studies* (qualitative evidence that yoga supports emotional regulation, self-awareness, and academic focus).
20. Xue, P. (2025). *A Systematic Review of Mindfulness-Based Stress Reduction Programs in Academic Settings*. *Open Psychology Journal* (MBSR significantly lowers stress and improves emotional regulation in students).
21. Yuan, M. (2025). *Enhancing Academic Resilience Through Mindfulness Training*. *Frontiers in Psychology* (mindfulness improves academic resilience and psychological flexibility in university students).
22. Wang, X., et al. (2025). *Exploring the Impact of Mindfulness and Subjective Well-Being on Academic Performance*. *Humanities and Social Sciences Communications* (mindfulness positively relates to academic performance, with subjective well-being as a mediator).