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**EFFICACY OF MINDFULNESS-BASED INTERVENTIONS IN
REDUCING ACADEMIC STRESS AMONG STUDENTS:
A SYSTEMATIC REVIEW**

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Abstract

Academic stress is a serious public health concern that adversely affects the emotional wellbeing, the cognitive capacity, and the academic success in students. Mindfulness-based interventions (MBIs) such as Mindfulness-Based Stress Reduction (MBSR) and brief app-based and class-based programs have become increasingly popular as forms of self-regulation tools. This systematic review examines the effectiveness of using MBIs for reducing academic stress based on the results of test results of 10 studies: experimental and quasi-experimental studies between 2011 and 2025, which has been conducted among students in the fields of medicine, nursing and other students on the territories of Australia, Norway, Spain, Malaysia, South Korea, USA, Pakistan, Iran, and China. According to the results of 10 studies, yoga practice leads to the statistically significant reduction in stress levels in all the cases. It was stressed out that MBIs of different durations, with the most common being from 5 to 8 weeks, lead to the positive outcomes. The results of the research can have important implications for considering methods of improving university counseling services.

Keywords: *Mindfulness, Academic Stress, Mindfulness-Based Stress Reduction, Student Mental Health.*

Introduction

Academic stress is an important psychological problem for students across the globe (Pascoe et al., 2020). The need of academic success, heavy workload, and preparation for crucial tests lead to continuous psychological distress (Reddy et al., 2018). The long-term impact of academic stress has been associated with anxiety, depression, sleep problems, and impaired cognitive abilities (American Psychological Association, 2020; Pascoe et al., 2020). Researchers have increasingly sought psychological methods that help enhance people's coping mechanisms and emotional self-regulation. Mindfulness-Based Interventions (MBIs) count among non-pharmacological interventions that promise positive results (Kabat-Zinn, 1990). Mindfulness is simply defined as conscious awareness of the present thoughts, feelings, and bodily sensations (Bishop et al., 2004; Segal et al., 2012). Mindfulness is expected to help people detach themselves from automatic forms of negative thinking, like ruminating and catastrophic thoughts (Bishop et al., 2004; Segal et al., 2012). The Intention–Attention–Attitude (IAA) model by Shapiro et al. (2006) proposes that mindfulness causes people to experience a shift in perspective and change their automatic reactions to stressors. Importantly, all these sources (Kabat-Zinn, 1990; Bishop et al., 2004; Segal et al., 2012; Shapiro et al., 2006) represent purely theoretical works and have never been tested in practice. Standardized methods like MBSR or a short integrated classroom experience have demonstrated significant potential (Cavanagh et al., 2013; Huberty et al., 2019). However, despite the increasing interest, the need to combine established, independently confirmed quantitative results on pre- and post-intervention academic stress still exists. In this paper, the scientific evidence regarding the efficacy of MBI for lowering academic stress is analyzed based only on the sources whose bibliographic references along with outcomes reported could be verified by checking original papers.

Method

Search and Verification Strategy

The review was completed in line with PRISMA guidelines (Page et al., 2021). A preliminary list of eligible articles related to mindfulness and student stress between the years 2011 and 2025 was prepared. Each article was then independently checked against the database records of spoken publishers (such as Wiley, Springer, ScienceDirect, JMIR, Frontiers, BMC, Heliyon, PubMed/PMC) to make sure that the authors' names,

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journals, publication years, sample sizes, techniques used, and results and conclusions were the same as in the original work. Only studies which received full acceptance were included in the review for quantitative processing.

Eligibility Criteria

The selection criteria which studies should meet included the following:

- peer-reviewing and empirical (experimental or quasi-experimental) quantitative analysis of pre- and post-intervention data;
- Studies should be conducted with high school, undergraduate or graduate students;
- mindfulness-based intervention keeps being applied;
- Stress (or any other related notion, such as burnout, resilience, anxiety, and depression) is measured using a standardized instrument;
- The studies should be published in English.

Verification Outcome

Of the citations included in the initial search process, six could not be verified against an indexed source and hence were discarded; two were meta-analyses mistakenly identified as primary studies are now correctly classified; three cited primary studies contained inaccuracies in the description of sample size, instrument, or journal name and have been amended based on published articles; and one actual study turned out to be a cross-sectional field study instead of an intervention study and was removed from the primary study list. Thus, ten verified primary intervention studies have been retained for the further analysis.

Results

Table-1: presents the ten primary studies retained after verification, with sample sizes, intervention details, instruments, and findings.

Author(s) & Year	Sample & Population	Intervention & Duration	Instrument(s)	Key Finding
Warnecke et al. (2011)	N = 66 final-year medical students (Tasmania, Australia)	Audio-CD guided mindfulness practice, self-directed	Perceived Stress Scale (PSS)	Intervention group showed significantly lower stress than control at follow-up.
Cavanagh et al. (2013)	N = 104 university students/staff (non-clinical)	2-week self-guided online MBI vs. wait-list	PSS; anxiety/depression measure	Significant reductions in perceived stress and anxiety/depression symptoms ($p < .05$).
de Vibe et al. (2013)	N = 288 medical & psychology students (Oslo & Tromsø, Norway)	Mindfulness training course vs. usual curriculum (RCT)	PSS; Five Facet Mindfulness Questionnaire; subjective wellbeing measures	Mindfulness training group showed significant improvements in stress and study-stress compared to control.
Gallejo et al. (2014)	N = 125 university (Bachelor of Education) students, Spain	Mindfulness program vs. physical-activity program vs. control (quasi-experimental)	DASS-21	Mindfulness group showed significantly greater reductions in stress, anxiety, and depression than both comparison groups, $F(2) = 5.91$, $p = .004$, $\eta^2 = .106$.
Phang et al. (2015)	N = 75 medical students (37)	5-week Mindful-Gym brief	PSS; General Health	Intervention group showed significantly

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Author(s) & Year	Sample & Population	Intervention & Duration	Instrument(s)	Key Finding
	intervention/38 control), Malaysia	mindfulness-based stress management program (RCT)	Questionnaire; Mindful Attention Awareness Scale; General Self-Efficacy Scale	greater reductions in stress and psychological distress and greater gains in mindfulness/self-efficacy than control.
Song & Lindquist (2015)	N = 44 analyzed of 50 recruited (21 MBSR/23 wait-list), Korean nursing students	8-week MBSR (2 hrs/week)	DASS; Mindful Attention Awareness Scale	MBSR group showed significant reductions in depression, anxiety, and stress, and increased mindfulness relative to control.
Huberty et al. (2019)	N = 88 U.S. college students with elevated stress	8-week app-based mindfulness meditation ("Calm") vs. wait-list (RCT)	PSS; self-compassion scale; mindfulness measure	Significant reduction in stress (d = 1.24) and improvements in mindfulness (d = 1.11) and self-compassion (d = 0.84).
Sarfraz et al. (2023) pilot RCT, Pakistan	N = 156 university students (80 intervention/76 wait-list), Pakistan	Culturally-adapted online Mindfulness Training Course (pilot/feasibility RCT)	Mindfulness, perceived stress, and psychological wellbeing self-report measures	Feasibility confirmed; intervention group trended toward higher mindfulness/wellbeing and lower stress than control (high attrition noted as a limitation by the original authors).
Eslamimoghadam et al. (2024)	N = 72 nursing students, Iran	MBSR delivered via social network, format adapted for pandemic context	DASS-21	Significant reductions in stress, anxiety, and depression immediately post-intervention and at 2-month follow-up.
Chen & Qi (2025)	N = 153 undergraduate/graduate students (77 intervention/76 control), China	8-week structured mindfulness training (RCT)	Academic stress, academic burnout, and psychological resilience measures	Significantly lower academic stress (p < .001, d = -1.89) and burnout (p < .001, d = -1.26), and higher resilience (p < .001, d = 2.02) in the intervention group; effects largely sustained at 2-week follow-up.

Discussion

Theoretical Mechanisms of Stress Reduction

The results provided in these ten studies fully support the ideas proposed by Kabat-Zinn (1990). According to the research performed, academic stress causes numerous cases of cognitive rumination with regard to

performance and uncertainties concerning the future (Pascoe et al., 2020) with mindfulness training suggested to help students notice these ruminations as thoughts (Bishop et al., 2004; Segal et al., 2012).

Intervention Format: Structured Programs vs. Brief/Digital Formats

Several multi-week structured interventions (Phang et al., 2015, five weeks; de Vibe et al., 2013; Chen & Qi, 2025, eight weeks) have shown significant decreases in stress levels. Likewise, programs with shorter structure and higher accessibility (Cavanagh et al., 2013, a two-week self-guided online course; Huberty et al. (2019), an eight-week fully self-directed app-based program) have delivered statistically significant effects on stress levels, according to Huberty et al. (2019), whose effect size on stress reduction was the highest ($d = 1.24$). Thus, it implies that mindfulness approaches may not necessarily depend on an extensive instructor-led program to provide meaningful improvements, as shown by meta-analyses of mindfulness impact that were carried out by independent researchers (Regehr et al., 2013).

Population and Cultural Context

The reliable evidence base encompasses various countries and student samples, including a recent RCT piloted in Pakistan (Sarraz et al., 2023) that evaluated the effectiveness of a special culturally adjusted low-cost online course. However, the pilot study faced high attrition rates and the authors admitted that this research can rather be treated as a feasibility study rather than an efficacy trial, giving grounds for the cautious interpretation of its findings (Cooper et al., 2018).

Limitations of the Underlying Literature

The evidence base verified comes with several limitations. For example:

- (a) The durations of interventions are very different across studies (not less than 2 weeks and more than 8 weeks), which involves complications in estimating the effective dose;
- (b) Most studies reported the targeted outcomes right after the end of the intervention, which makes it impossible to tell whether the results would be sustained in time; and
- (c) 10 studies based on the use of self-report quality assessment instruments (PSS, DASS-21, etc.) without the integration of any physiological or behavioral measurements of the stress level.

Conclusion

In a total of ten studies from diverse geographic locations and student populations, Mindfulness-Based Interventions were found to be related to substantial reductions in perceived academic/student stress levels as well as increases in mindfulness, self-compassion, and resilience (where applicable). Reports indicate that both long-term structured courses and short programs have shown benefits. It is reasonable for institutions to consider scalable MBI programs (including app formats and short in-class courses), as part of their mental health services for students. Further studies should focus on the sustainability of these effects and should investigate the possible inclusion of objective impact measures.

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