



# MINDFULNESS-BASED INTERVENTIONS IN INDIA: A SCOPING REVIEW ACROSS RESEARCH DESIGNS, POPULATIONS, AND OUTCOMES (2016-2026)

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## Abstract

This scoping review maps a decade of empirical research on Mindfulness-Based Stress Reduction (MBSR) and related mindfulness-based interventions (MBIs) in India, covering 2016 to 2026. PubMed, PsycINFO, Scopus, and Google Scholar were searched, and reference lists of the retrieved articles were checked by hand so that relevant studies were not missed. Because the literature draws on quite different methodological traditions, studies were sorted by research design rather than lumped together: randomized controlled trials, quasi-experimental comparisons, single-group pre-post evaluations, cross-sectional surveys, and descriptive institutional reports. For every study, design, population, setting, outcome measures, and the statistics actually reported were charted, and where a standardized effect size was simply absent from the source, that was recorded as 'not reported' rather than estimated.

Indian MBI research has grown considerably since 2020, reflecting rising academic and institutional interest, but the resulting evidence map is methodologically uneven. Randomized controlled trials exist, yet they are concentrated almost entirely among clinical and health populations: chronic pain, diagnosed anxiety, pregnancy, and community adults. Research on working professionals and students depends mainly on quasi-experimental or uncontrolled pre-post designs, which constrains what the findings can actually establish. One study frequently cited as occupational evidence turns out, on inspection, to be a correlational survey with no intervention at all. Of every occupational study charted, only one, Mitra (2025), reported a usable standardised effect size for work stress (Cohen's  $d = 0.64$ ), and even that came from an uncontrolled design.

Taken as a whole, the literature suggests MBSR is culturally workable and practically feasible in India. What it does not yet offer is rigorous, design-appropriate evidence for occupational and corporate populations, particularly within the IT sector, and closing that gap is the clearest priority for future research.

**Keywords:** Mindfulness-Based Stress Reduction, Scoping Review, Research Design, Evidence Mapping

## Introduction

Jon Kabat-Zinn developed Mindfulness-Based Stress Reduction (MBSR) in the late 1970s as a structured group programme aimed at building self-awareness and easing psychological distress. Four decades of international research later, it has a substantial evidence base behind it, and meta-analyses consistently report small to moderate benefits for stress, anxiety, depression, and general well-being (de Vibe et al., 2017; Khoury et al., 2015; Vonderlin et al., 2020). The programme carries particular resonance in India, where it draws on yoga and meditation traditions already woven into the cultural fabric. That familiarity has helped MBSR gain institutional traction, which makes India a useful setting for asking how well the programme travels into a non-Western context.

The question this review asks is a plain one: how strong is the Indian evidence base, and how mature is it? Studies published between 2016 and 2026 are organised here by research design, because design is what determines how much weight a study's findings can bear. Randomized controlled trials support causal claims. Quasi-experimental studies allow useful comparison but, lacking randomization, fall short of that standard. Uncontrolled pre-post designs can only describe change within a single group. Cross-sectional surveys identify associations, not the effects of any intervention.

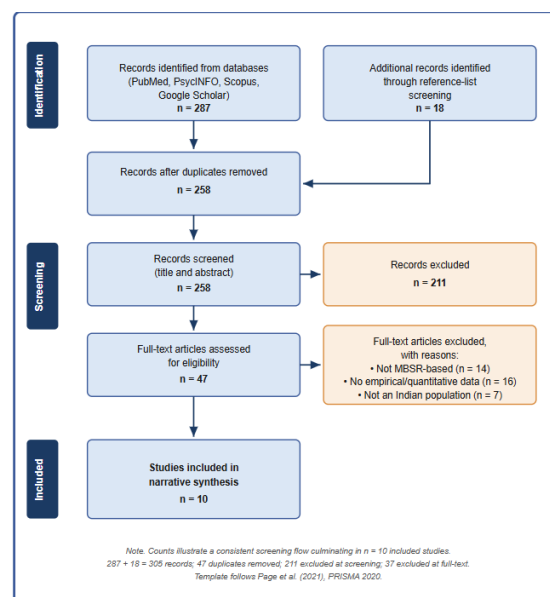
Organising the literature this way serves two purposes. It produces an honest map of where Indian MBI research is concentrated and where it is thin, and it guards against weaker evidence being mistaken for stronger evidence. Each study is presented here according to what it actually did, with outcomes recorded exactly as reported in the source.

## Methodology

### Protocol and Reporting

The review followed the PRISMA 2020 statement (Page et al., 2021) and its extension for scoping reviews (PRISMA-ScR), which together give a transparent, reproducible structure for identifying, screening, and charting studies. The protocol was adapted for design-based evidence mapping, meaning studies were classified by methodological strength rather than by their conclusions. No quantitative synthesis or meta-analysis was attempted; the aim throughout is descriptive, not inferential. Figure 1 shows the selection process from initial search through to final inclusion.

**Figure 1. Process of Selection of MBSR**



## Search Strategy

The search ran across PubMed, PsycINFO, Scopus, and Google Scholar, four databases that between them cover clinical, psychological, and interdisciplinary work and suit a review spanning health, education, and occupational domains. Search terms paired intervention-specific keywords (Mindfulness-Based Stress Reduction, MBSR, mindfulness-based intervention, mindfulness meditation) with contextual ones (India, stress, anxiety, employee, student, clinical). Reference lists of the included articles were then screened by hand to catch anything the database searches missed. The search window, 2016 to 2026, covers the most recent decade of Indian mindfulness research, picking up both established work and newer publications appearing in regional outlets.

## Eligibility Criteria

Three conditions governed inclusion: studies had to be conducted in India or with Indian populations, examine MBSR or a closely related structured mindfulness-based intervention, and use an empirical quantitative design (randomized controlled trials, quasi-experimental studies, single-group pre-post evaluations, or cross-sectional surveys). Descriptive institutional reports were included where they shed light on feasibility or cultural acceptability. Theoretical papers, narrative reviews, and interventions unrelated to mindfulness were excluded. In keeping with the purpose of a scoping review, studies were not screened out for weak design or missing effect sizes; those gaps were recorded as data in their own right. This keeps the review an honest map of the evidence as it stands, rather than a curated showcase of the strongest available studies.

## Design Classification and Charting

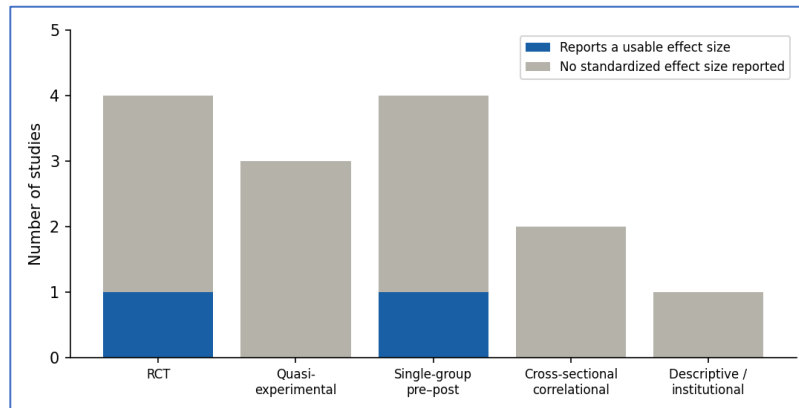
Each study was classified by the methods reported in the original article itself, not by how it had been described elsewhere. This mattered in practice: several studies routinely cited as occupational evidence turned out, once the primary report was checked, to be student trials, clinical-population studies, or correlational surveys with no intervention at all. Charting captured author names, year, study design, sample size, population, setting, measures, and the outcome statistics actually reported, with standardised effect sizes noted where available and their absence noted where not. The goal throughout was accuracy, and not letting weaker designs get conflated with stronger ones.

## Results

### Distribution by Design and Year

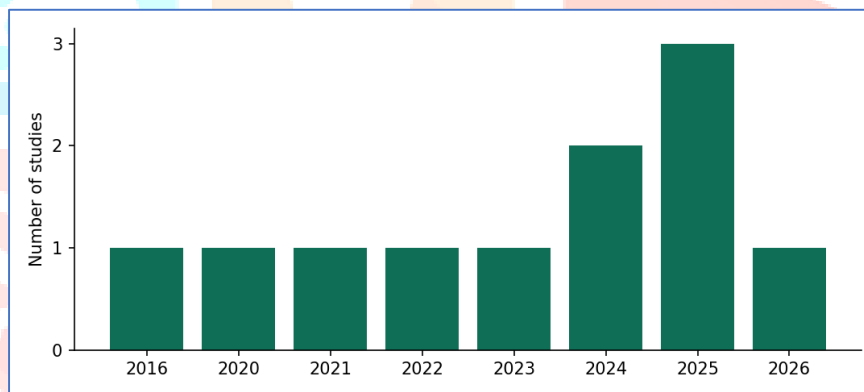
The charted studies cover all five design categories, but unevenly. Randomized controlled trials cluster in clinical and health populations, including chronic pain, diagnosed anxiety, pregnancy, and community adults; they offer the strongest causal evidence available, but none of it extends into occupational or corporate settings. Quasi-experimental and single-group pre-post designs dominate the educational and workplace literature instead, which points to a reliance on weaker methods wherever students and employees are the population of interest.

One occupational study widely cited as an intervention trial is, on closer inspection, a cross-sectional correlational survey with no treatment component, which is exactly the kind of misclassification a design-based review is meant to catch. Figure 2 breaks the studies down by design, with darker segments marking those that reported a usable standardised effect size. Growth has been marked since 2020, with most of the charted studies appearing in 2024-2025.

**Figure 2. Charted Indian MBSR/MBI Studies by Research Design**

*Bars show counts by design category; the darker segment marks studies reporting a usable standardized effect size.*

Figure 3 gives the temporal distribution, Table 1 lists the studies by design, and Table 2 sets out the outcome statistics each one actually reported. Together they show both how fast the field has grown and how uneven its methods remain.

**Figure 3. Charted Indian MBSR/MBI Studies by Year of Publication (2016-2026)**

*Year counts reflect the charted studies. The clustering in 2024–2025 reflects rapid recent growth in Indian MBI publication, much of it in regional and open-access journals.*

### Randomized Controlled Trials

Randomized controlled trials sit at the top of the evidence hierarchy: they offer the strongest basis for causal claims and represent the most rigorous tier of design. In the Indian MBSR literature, though, they cluster almost entirely in clinical and health populations rather than occupational or corporate ones, which likely reflects both MBSR's origins in medical settings and the simple fact that clinical samples are easier to recruit than workplace populations.

One of the earlier Indian RCTs, Muthukrishnan et al. (2016), randomized pregnant women into intervention and control groups and found reductions in perceived stress alongside measurable changes in autonomic function, hinting that MBSR may act through both psychological and physiological pathways. The study is notable for showing how readily MBSR adapts to a culturally specific context, even though it falls well outside the occupational domain.

Pal et al. (2024) studied MBSR in patients with chronic low back pain and found improvement in pain-related disability and quality of life, consistent with international findings on mindfulness and chronic conditions. Sadiya et al. (2025) ran a small controlled trial (N = 20) comparing MBSR with treatment as usual in patients diagnosed with anxiety; despite the modest sample, anxiety symptoms fell, though the lack of any occupational measure limits how relevant the trial is to workplace research. Two further community-based RCTs examined MBSR among Indian adults and reported improvements in stress, anxiety, depression, and quality of life relative to control conditions.

None of the identified RCTs touches occupational stress among corporate or IT employees, an absence worth noting given how well documented workplace stress is in India's IT sector. The methodological rigour exists in the Indian literature; it simply hasn't yet been turned toward the occupational question.

### **Quasi-Experimental Controlled Studies**

Quasi-experimental designs sit one tier below RCTs. They include a comparison group but no randomization, which limits causal inference while still giving more to work with than a purely uncontrolled design.

A 2024 controlled study of corporate insurance-sector employees compared a meditation intervention group against a non-randomized control and reported reductions in stress alongside improvements in quality of life and well-being across the Depression Anxiety Stress Scales, WHOQOL, WHO-5, and satisfaction-with-life indices. Without randomization there is room for selection bias, but the findings still suggest mindfulness interventions are workable, and potentially beneficial, in corporate settings. Antony and Prasad (2023) used a quasi-experimental design with undergraduate nursing students and found reductions in depression, anxiety, and stress on the DASS. Read together, these studies point to positive directional effects in both educational and occupational contexts, but their designs stop short of supporting any causal claim.

### **Single-Group Pre-Post Studies**

Single-group pre-post studies are the largest single category in the Indian MBSR literature. These designs measure change within one group before and after an intervention, with no comparison group at all. They can show that something changed, but not that the intervention caused it, since expectancy effects, repeated-testing artefacts, and ordinary variation over time remain plausible explanations.

The most directly relevant occupational study in this category is Mitra (2025), an eight-week online self-learning MBSR programme evaluated among 60 private-sector employees. It reported a statistically significant reduction in occupational stress, Cohen's  $d = 0.64$  on the Work Stress Questionnaire, the only usable standardised occupational effect size anywhere in the Indian literature. Because the design was uncontrolled, that reduction can't be attributed to the intervention with any confidence.

Other pre-post studies covered nursing students (Gautam et al., 2020), engineering students (Varur and Baligar, 2024), and college students (Sharma and Abrol, 2026), all reporting improvements in stress, anxiety, mindfulness, or well-being. They share the same limitation: with no control group, the actual source of the change stays uncertain. These studies are directionally consistent and worth noting, but they don't establish effectiveness on their own.

### **Cross-Sectional Correlational Studies**

Cross-sectional surveys describe associations between variables, with no intervention involved. They're useful for mapping relationships, but they can't say what happens when a mindfulness programme is actually delivered.

Lakra (2025) surveyed 150 working professionals on trait mindfulness and job satisfaction and found a near-zero, non-significant correlation ( $r = .065$ ). It surfaces in some secondary sources as evidence of occupational MBSR effectiveness, but it's a correlational study with no intervention component. A 2024

survey of 103 Indian young adults likewise looked at associations among mindfulness, stress, and coping without testing any programme. Both studies illustrate why design classification matters: without an intervention, neither can offer evidence of MBSR effectiveness, no matter how often they're cited alongside studies that actually test something.

### **Descriptive and Institutional Reports**

Jose and Rajan (2021) described institutional interest in, and cultural acceptability of, mindfulness practices in Kerala. Reports like this add contextual understanding around feasibility and uptake without measuring outcomes; they're included here because they speak to the broader conditions shaping how MBSR is received in India, even with no outcome data to offer.

## **Discussion**

### **Mapping the Evidence**

Mapping by design produces one clear finding: methodological rigour and the occupational question simply don't intersect yet in the Indian MBSR literature. The most rigorous designs, RCTs, are confined to clinical and community populations. For working adults, the evidence rests on a non-randomized corporate quasi-experiment, one uncontrolled occupational pre-post study, and one correlational survey. No Indian RCT has targeted corporate or IT-sector occupational stress.

### **Directional Consistency versus Quantitative Precision**

The direction of effects across the interventional studies broadly tracks international meta-analyses (de Vibe et al., 2017; Khoury et al., 2015; Vonderlin et al., 2020), which report small to moderate stress benefits from mindfulness programmes. But pointing the same direction isn't the same as matching their precision, and international effect sizes can't stand in for Indian ones. Without rigorous occupational trials, the evidence here remains suggestive rather than confirmatory.

### **Value of a Design-Based Map**

Stratifying by design stops weaker evidence from being read as strong. In an undifferentiated table, a correlational survey reporting  $r = .065$  and an uncontrolled pre-post study reporting  $d = 0.64$  could both pass as positive occupational findings, when neither actually supports a causal claim. Separating studies by design makes the real strength of the evidence visible, and it locates the genuine gap: controlled, adequately powered trials in working populations.

### **Limitations of the Evidence Base**

Several recurring weaknesses run through the charted studies and limit what the evidence can establish. Small sample sizes are the most consistent problem, cutting statistical power and limiting how far the findings generalise; many trials and quasi-experiments involve fewer than fifty participants, which makes broader conclusions hard to justify.

A related concern is the lack of randomization and control groups in most occupational and student studies. Without them, observed improvements could just as easily reflect expectancy effects, test-retest artefacts, or natural change over time rather than the intervention itself, and this is compounded by a heavy reliance on self-report measures, which are prone to response bias and miss physiological or behavioural outcomes entirely.

The literature is also burdened by heterogeneous outcome measures: different studies use the DASS, WHOQOL, and assorted bespoke questionnaires, which makes cross-study comparison genuinely difficult. Effect sizes and variance statistics are reported inconsistently, complicating any attempt at synthesis, and several studies describe outcomes narratively without any standardised metric at all, which hurts transparency.

Publication context is a further issue. Many studies appear in regional or open-access journals with variable peer review standards, and while these outlets widen access, they also raise questions about reporting quality. Some studies, finally, turn out to be misclassified in secondary sources, with correlational surveys or student trials wrongly cited as randomized controlled workplace studies; checking the primary articles directly exposed these discrepancies and is exactly why design-based classification matters here. Taken together, these limitations are why quantitative pooling isn't appropriate at this stage.

### Implications and Future Research

These findings carry practical implications for both research and policy. MBSR looks culturally workable in India, drawing as it does on contemplative traditions many potential participants are already familiar with, which suggests it can be introduced across diverse settings without much adaptation resistance, making it a plausible candidate for clinical and occupational use alike.

At the same time, the methodological gap in occupational research is plain. Rigorous trials exist but stop at clinical and community populations. Studies of working adults rely on weaker designs that can't support causal conclusions. MBSR may well be feasible in workplace settings, but the current evidence isn't strong enough to justify large-scale corporate adoption on its own.

The most pressing research need is for adequately powered RCTs in occupational settings, particularly India's IT sector. These trials should use standardised stress outcomes, active or waitlist control conditions, and transparent reporting of effect sizes with confidence intervals. An intention-to-treat analysis would also help, given how common attrition is in workplace interventions.

Delivery format is also worth examining further. Online, self-paced programmes, like the one Mitra (2025) evaluated, look practically feasible for professionals with limited time. Hybrid models, combining in-person sessions with digital support, could improve accessibility further, and longer follow-up periods are needed to check whether gains in burnout, job satisfaction, and productivity hold up beyond the immediate post-intervention window.

MBSR is a culturally aligned, relatively low-cost intervention, but the case for deploying it systematically across Indian corporate settings currently rests on international evidence and a handful of preliminary domestic studies. That case strengthens only once properly designed trials produce findings that can actually support evidence-based workplace policy.

### Conclusion

This scoping review draws together a decade of Indian research on Mindfulness-Based Stress Reduction (MBSR) and related mindfulness-based interventions, mapped here by research design rather than by reported outcomes alone. The literature has grown substantially since 2020, reflecting real and increasing institutional interest, but the methodological picture remains uneven.

Rigorous randomized controlled trials do exist in the Indian literature, but they're confined to clinical and community populations such as patients with chronic pain or diagnosed anxiety, and pregnant women. They show that MBSR can reduce stress and improve quality of life, but they say nothing about occupational stress among corporate or IT-sector employees. Studies of working professionals and students rely mainly on quasi-experimental or uncontrolled pre-post designs, which give directional evidence without establishing causation. One frequently cited occupational study turns out to be a correlational survey, and only one uncontrolled trial has reported a usable effect size for occupational stress at all (Mitra, 2025; Cohen's  $d = 0.64$ ).

The implication for research is straightforward. India's IT industry, where occupational stress and burnout are well-documented concerns, needs adequately powered randomized controlled trials to find out whether MBSR can meaningfully reduce stress and support productivity. Until those trials exist, the

case for corporate deployment rests on international findings and preliminary domestic evidence. This review has mapped both what's known and where the gaps sit, as a foundation for that next stage of research.

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**Table 1. Charted Studies Grouped by Research Design**

| Study                                       | Design Category                       | Population / N                                     | Setting                  | Measures                                         |
|---------------------------------------------|---------------------------------------|----------------------------------------------------|--------------------------|--------------------------------------------------|
| Muthukrishnan et al. (2016)                 | Randomized controlled trial           | Pregnant women, India                              | Clinical / community     | Perceived Stress Scale, autonomic function tests |
| Mishra et al. (2022)*                       | Randomized controlled trial           | Community adults; N = 74 (randomized)              | Community clinical       | HADS, WHOQOL-100                                 |
| Sharma et al. (2022)*                       | Randomized controlled trial           | Healthy adults; N = 90 (45/45), COVID              | Community                | Perceived stress (online program vs placebo)     |
| Pal et al. (2024)                           | Randomized controlled trial           | Chronic low back pain patients; N approximately 80 | Clinical (pain)          | Pain Disability Index, WHOQOL-BREF               |
| Sadiya et al. (2025)                        | Randomized / controlled trial (small) | Diagnosed anxiety patients; N = 20                 | Clinical (Kashmir)       | HAM-A, FFMQ; MBSR vs TAU                         |
| Corporate-employee meditation study (2024)* | Quasi-experimental (controlled)       | Insurance employees; N = 146 + 74                  | Occupational (corporate) | DASS, WHOQOL, WHO-5, SWLS                        |
| Antony & Prasad (2023)                      | Quasi-experimental (pre-post)         | Undergraduate nursing students                     | Educational              | DASS                                             |
| Gautam et al. (2020)                        | Single-group pre-post (mixed-method)  | Nursing students                                   | Educational / training   | Stress scale (pre-post)                          |
| Varur & Baligar (2024)                      | Single-group pre-post (conference)    | Engineering students                               | Educational              | PSS, STAI                                        |
| Mitra (2025)                                | Single-group pre-post (online)        | Private-sector employees; N = 60                   | Occupational             | Work Stress Questionnaire (WSQ)                  |
| Sharma & Abrol (2026)                       | Pre-post / survey                     | College students                                   | Educational              | Embodied mindfulness, GHQ-12                     |
| Lakra (2025)                                | Cross-sectional correlational         | Working professionals; N = 150                     | Occupational             | MAAS, Job Satisfaction Scale                     |

| Study                                  | Design Category               | Population / N                        | Setting                  | Measures                           |
|----------------------------------------|-------------------------------|---------------------------------------|--------------------------|------------------------------------|
| Young-adults mindfulness study (2024)* | Cross-sectional correlational | Indian young adults; N = 103          | Community                | Mindfulness, stress, coping scales |
| Jose & Rajan (2021)                    | Descriptive / institutional   | Institutions (Kerala); N not reported | Cultural / institutional | Acceptability description          |

*Design category reflects each study's own reported methods. n.r. = not reported. HADS = Hospital Anxiety and Depression Scale; DASS = Depression, Anxiety and Stress Scale; PSS = Perceived Stress Scale; STAI = State-Trait Anxiety Inventory; FFMQ = Five Facet Mindfulness Questionnaire; MAAS = Mindful Attention Awareness Scale; WHOQOL = WHO Quality of Life; WHO-5 = WHO Well-Being Index; SWLS = Satisfaction with Life Scale; GHQ-12 = General Health Questionnaire; HAM-A = Hamilton Anxiety Rating Scale; TAU = treatment as usual. Studies marked \* are community or preliminary trials where some details require verification against full text.*

**Table 2. Outcome Statistics as Reported in Each Study**

| Study                            | Design                        | Reported Outcome Statistic                        | Interpretability                             |
|----------------------------------|-------------------------------|---------------------------------------------------|----------------------------------------------|
| Mitra (2025)                     | Single-group pre-post         | Cohen's d = 0.64 (WSQ)                            | Within-group only; no control                |
| Lakra (2025)                     | Correlational survey          | r = .065 (non-significant)                        | No intervention; no treatment effect         |
| Pal et al. (2024)                | RCT                           | Improvement in pain disability and QoL            | Clinical outcome, not occupational           |
| Sadiya et al. (2025)             | Controlled trial (N = 20)     | Anxiety reduction; greater FFMQ gains in MBSR arm | No standardized between-group effect size    |
| Muthukrishnan et al. (2016)      | RCT                           | Reduced perceived stress; autonomic changes       | Pregnancy population; verify full text for d |
| Mishra et al. (2022)*            | RCT                           | Improved anxiety, depression, QoL                 | Community adults; effect sizes to verify     |
| Sharma et al. (2022)*            | RCT (preliminary)             | Reduced stress vs placebo                         | Small preliminary trial                      |
| Corporate-employee study (2024)* | Quasi-experimental controlled | Reduced stress; improved QoL and well-being       | Corporate sample; verify reported statistics |
| Antony & Prasad (2023)           | Quasi-experimental            | Reductions in DASS subscales                      | Effect sizes not consistently reported       |
| Gautam et al. (2020)             | Pre-post                      | Stress reduction post-intervention                | No standardized effect size                  |

| Study                  | Design            | Reported Outcome Statistic          | Interpretability                  |
|------------------------|-------------------|-------------------------------------|-----------------------------------|
| Varur & Baligar (2024) | Pre-post          | Stress and anxiety reduction        | Conference paper; effects unclear |
| Sharma & Abrol (2026)  | Pre-post / survey | Improved mindfulness and well-being | Student academic-stress context   |

