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Resilience !
FROM CELLS TO CLIMATE

THE SCIENCE OF MINDFULNESS AND STRESS RELIEF

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Areas of Expertise: Mindfulness-Based Interventions | Stress Appraisal & Regulation |
Preventive Mental Health



Stress has become so common that it is rarely questioned. Students call it academic pressure. Professionals call it workload. Families call it responsibility. It is normalised even expected.

But prolonged stress is not neutral. Chronic activation of stress responses disrupts sleep, weakens immune functioning, strains cardiovascular regulation, and impairs emotional control. Over time, it reshapes how individuals interpret and respond to everyday challenges. Stress stops being a reaction. It becomes a lens. Modern stress is shaped not only by external demands, but by how those demands are interpreted. Perceived stress reflects the extent to which life circumstances are appraised as overwhelming or beyond one's coping capacity. This appraisal process plays a central role in long-term psychological and physiological outcomes.

Stress is triggered by events, but it is intensified by the way those events are interpreted. Mindfulness alters this interpretive process. Because mindfulness sounds simple paying attention, observing the breath, staying present it is often dismissed as a superficial wellness practice. In scientific terms, however, mindfulness is structured attentional training. It involves observing thoughts, emotions, and bodily sensations without immediately identifying with them or reacting automatically. Stress intensifies when cognitive appraisal and physiological arousal reinforce one another. A stressor may trigger a thought, which activates autonomic arousal, further heightening the perceived threat. Without awareness, this cycle becomes habitual and self-reinforcing.

Mindfulness introduces a pause appraisal shifts. Rumination diminishes. Reactivity softens, which infers that the pause changes how we evaluate, dwell on thoughts, and respond. The stressor may remain unchanged but the

escalation process is interrupted. Evidence supports this mechanism. Across randomised controlled trials synthesised in recent evidence evaluating structured mindfulness-based interventions among non-clinical adults, the studies consistently report reductions in perceived stress compared with control conditions. Effect sizes in preventive mental health research are typically modest. Yet consistency across trials suggests that attentional training can meaningfully influence stress appraisal under controlled conditions. Perceived stress is not benign. Elevated levels predict increased vulnerability to anxiety, depressive symptoms, sleep disturbance, immune dysregulation, and cardiovascular strain. Even modest reductions, when implemented at scale, may carry meaningful public health implications. We should not wait for stress to become a disorder before deciding it deserves attention, because waiting for stress to crystallise into disorder is costly.

Mental health systems often step in only after symptoms reach a diagnostic level. A preventive approach, however, focuses earlier when stress patterns are still flexible, and change is more possible. When implemented with care and consistency, mindfulness-based interventions can play an important role here. They are adaptable across settings and can be integrated into universities, workplaces, and community environments not as therapy, but as a foundational skill that strengthens regulation before stress escalates. At the same time, mindfulness is not simply an app reminder or a social media trend. It is most effective when practiced as a structured, disciplined process. Programs such as Mindfulness-Based Stress Reduction (MBSR) and Mindfulness-Based Cognitive Therapy (MBCT) involve guided practice over several weeks. Their outcomes depend on engagement, regular practice, and thoughtful



implementation.

On an individual level, practice often begins in simple moments: noticing the breath before reacting during conflict, pausing before replying to a difficult message, recognising the thought “I cannot handle this” as a mental event rather than an unquestioned fact. Consider a student facing examination pressure. The thought arises: I am going to fail. The body tightens. Anxiety increases. Without awareness, the mind spirals. With training, the student notices the thought, observes the physical reaction, and gently redirects attention to the task. The exam itself has not changed. What changes is the internal escalation. Mindfulness does not remove stressors. It changes the way we relate to them. Its mechanism is specific: it strengthens attention and emotional regulation, making appraisal more balanced. It does not replace structural causes of stress, such as economic pressures or institutional demands. Instead, it addresses how stress is processed internally. Importantly, mindfulness draws on capacities we already possess attention and self-regulation. When nurtured deliberately, these capacities can become protective resources rather than dormant abilities. Research suggests that structured mindfulness-based programs can reduce perceived stress under controlled conditions. Bringing those findings into everyday settings requires careful implementation and realistic expectations.

Preventive mental health does not grow through trends. It grows through steady, evidence-informed practice that reduces avoidable suffering.

What is triggered automatically can be regulated intentionally.

Ms. Anisha Rajan’s contributions to this field are reflected in his publication in *npj Mental Health Research*, “Effects of mindfulness-based interventions on perceived stress among non-clinical adults: a systematic review and meta-analysis,” <https://doi.org/10.1038/s44184-026-00188-4>, which systematically evaluates existing evidence to assess how mindfulness-based interventions reduce perceived stress in non-clinical adult populations, providing consolidated scientific insight into their effectiveness for mental well-being.