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yusra@aeirc-edu.com

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Editorial

Healing Beyond Walls: Dr. Shamoon Noushad's Nature-Based Therapy Model for Psychophysiological Rehabilitation in Pakistan.

Yusra Saleem 

Department of Health Physical Education & Sports Sciences, Karachi, Pakistan.

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Abstract

Pakistan faces an escalating mental-health crisis exacerbated by socioeconomic instability, post-disaster trauma, and environmental degradation. Conventional clinical resources remain insufficient to meet this growing burden, underscoring the need for evidence-based, low-cost, and culturally adaptive interventions. Clinical psychophysiological Dr. Shamoon Noushad has advanced a novel Nature-Based Therapy (NBT) framework that integrates environmental exposure, heart-rate variability biofeedback, and guided mindfulness to restore psychophysiological balance. This editorial examines the theoretical foundations, empirical evidence, and implementation trajectory of NBT within Pakistan's health ecosystem, positioning it as a scalable model for trauma recovery and psychosocial rehabilitation.

Introduction

Globally, the prevalence of stress-related and affective disorders has prompted a shift toward non-pharmacological rehabilitation strategies. In Pakistan, the economic burden of untreated mental illness was estimated at approximately PKR 250 billion annually, driven by lost productivity and healthcare costs [1]. Limited infrastructure, stigma, and workforce shortages have constrained access to conventional mental-health services.

Within this context, Dr. Shamoon Noushad, a clinical psychophysiological and neuroscientific researcher, has pioneered Nature-Based Therapy (NBT), a structured therapeutic model that integrates psychophysiological monitoring with controlled nature exposure. His approach operationalizes the biopsychophysiological paradigm, which recognizes the interdependence of environmental, neural, and autonomic systems in emotional regulation and resilience. "Nature isn't a luxury—it is a neurobiological necessity," emphasizes Dr. Noushad. "Our autonomic nervous system evolved in synchrony with natural rhythms; disconnection from them is itself a stressor."

"Nature is not a luxury; it is a mental-health necessity," Dr. Noushad emphasizes, a philosophy that underpins his goal of developing scalable, evidence-driven interventions that reduce pharmacological dependence while strengthening community resilience.

Building on these outcomes, Dr. Noushad has designed hospital-based NBT protocols for women recovering from obstetric trauma and postnatal distress, integrating nature immersion with HRV biofeedback and therapist-guided emotional regulation. These programs illustrate the feasibility of NBT within formal healthcare environments.

Conceptual and Theoretical Foundations

Nature-Based Therapy (NBT) synthesizes principles from environmental psychology, psychophysiology, and affective neuroscience to restore psychophysiological balance and emotional stability. The therapy primarily targets the autonomic nervous system (ANS) particularly the vagal-parasympathetic axis, to promote autonomic coherence and neuroendocrine regulation. Central to this model is the use of heart-rate variability (HRV) biofeedback, which facilitates regulation of vagal tone and stress reactivity through real-time physiological feedback. Complementing this are guided mindfulness and controlled breathing exercises, which modulate cortical-limbic pathways, enhance prefrontal control over the amygdala, and promote parasympathetic dominance.

NBT also integrates resilience-focused group activities designed to encourage prosocial engagement and collective emotional regulation; an essential factor in communities affected by trauma. Moreover, nature immersion plays a pivotal role, as exposure to natural stimuli such as phytoncides, fractal visual patterns, and green environments has been shown to downregulate hypothalamic–pituitary–adrenal (HPA) axis activation and reduce systemic cortisol levels [2]. In contrast to conventional therapy confined within clinical environments, NBT repositions nature as an active co-therapist, harnessing ecological stimuli to induce measurable psychophysiological recalibration.

Empirical Evidence

A randomized controlled trial conducted by Noushad et al. demonstrated that structured nature-based physical activity significantly improved post-traumatic growth, autonomic regulation, and biochemical stress markers among healthcare workers with post-traumatic stress [3]. In designing Nature-Based Therapy (NBT), Dr. Noushad and team selected biomarkers informed by a systematic review of chronic-stress physiology. The review identifies key physiological biomarkers, including cortisol, IL-6, BDNF, catecholamines, C-reactive protein, and metabolic markers—as robust indicators of sustained stress in humans [4]. This evidence supports combining HRV biofeedback with biochemical monitoring to track intervention efficacy across endocrine, autonomic, and immune pathways.

A subsequent study involving breast-cancer survivors reported comparable psychophysiological gains through Nature Walk Therapy, outperforming conventional supportive counseling in both psychometric resilience and biomarker normalization [5].

Clinical and Community Implementation

Building upon these results, Dr. Noushad's team designed hybrid Nature-Based Therapy (NBT) protocols tailored for diverse demographic groups. Hospital-based programs have been implemented for women recovering from obstetric trauma and postpartum depression, integrating HRV biofeedback with guided nature exposure to promote physiological and emotional recovery. In parallel, community immersion sessions—such as forest walks and park-based mindfulness groups—have been developed for trauma survivors and disaster-affected populations, providing structured opportunities for stress regulation and collective healing. Additionally, urban “Mind-and-Trees” initiatives in Karachi's low-income neighborhoods utilize accessible green spaces to facilitate group-based emotional regulation and community cohesion. Each session employs portable psychophysiological devices to offer participants real-time feedback on HRV and respiratory rate, thereby enhancing self-regulation literacy and biofeedback awareness.

Preliminary analyses indicate statistically significant improvements in sleep quality, mood stabilization, and subjective well-being, along with reduced reliance on pharmacological anxiolytics in follow-up assessments.

“We are only beginning to understand how nature speaks to the nervous system,” says Dr. Noushad. “The future of therapy lies in merging neuroscience with the natural world—restoring balance, one heartbeat at a time.”

Capacity Building and Knowledge Translation

A central tenet of the NBT initiative is capacity building within Pakistan's health workforce. Since 2021, more than 150 clinicians and allied professionals have undergone structured training in trauma-informed psychophysiological protocols and community-based ecological therapy [3,5].

The forthcoming Psychosocial Sustenance Plan, co-developed by Dr. Noushad, aims to standardize NBT implementation across hospitals, rehabilitation centers, and community organizations, emphasizing cultural adaptability and cost-efficiency.

“Healing is not merely about accessibility,” Dr. Noushad asserts. “It's about relevance; the therapy must resonate with the sociocultural and ecological realities of the people it serves.”

Global and Policy Relevance

Dr. Noushad's work aligns directly with the World Health Organization's Comprehensive Mental Health Action Plan (2023–2030), which prioritizes community-based, non-pharmacological, and sustainable approaches to mental well-being [6].

Furthermore, it contributes to the emerging discipline of climate-responsive mental health, recognizing that ecological restoration and psychological resilience are interconnected. By positioning nature as a therapeutic infrastructure, Pakistan's NBT framework provides a replicable model for other low and middle-income countries (LMICs) grappling with mental-health resource disparities.

Conclusion

As Pakistan confronts concurrent crises of trauma, socioeconomic disparity, and ecological degradation, Nature-Based Therapy offers an empirically grounded, scalable, and culturally resonant solution. By merging psychophysiological science with ecological immersion, Dr. Shamoon Noushad's work redefines rehabilitation as a biosocial process, one where the boundaries between mind, body, and environment dissolve into a continuum of healing. This model exemplifies how translational research in psychophysiology can inform sustainable mental-health policy and population level resilience, one green step at a time.

Future Directions

Building on Dr. Shamoon Noushad's pioneering research in psychophysiological rehabilitation and Nature-Based Therapy (NBT), future work aims to expand empirical validation through large-scale, multicenter trials that integrate neurophysiological and biochemical markers such as HRV, EEG, cortisol, and cytokines.

Ongoing studies led by Dr. Noushad's team are exploring the long-term effects of NBT on neural plasticity, autonomic regulation, and resilience in trauma-affected populations. The next phase of his research focuses on developing digital biofeedback platforms and mobile-based NBT applications to enhance accessibility in

underserved regions, alongside cross-disciplinary collaborations linking clinical neuroscience, environmental psychology, and community health. These efforts are expected to strengthen the scientific foundations of NBT and facilitate its inclusion in national mental-health policies as a cost-effective, culturally adaptive, and sustainable intervention model for trauma recovery and stress management.

The Mind behind the model

Dr. Shamoon Noushad is a clinical psychophysiological, educator, and global mental-health innovator based in Karachi, Pakistan. His work focuses on the neurobiological and physiological mechanisms of stress, emotional regulation, and trauma recovery, using biomarkers such as heart-rate variability (HRV), EEG, cortisol, and cytokines to quantify therapeutic change. Dr. Noushad has authored and co-authored numerous peer-reviewed studies on biofeedback, neurofeedback, and nature-based interventions [1,2,5], positioning him as a pioneer of psychophysiological rehabilitation in Pakistan. He has trained more than 150 clinicians and allied-health professionals in trauma-informed psychophysiological practice and co-developed the Psychosocial Sustenance Plan, a standardized national framework for the implementation of Nature-Based Therapy (NBT) in hospitals and community-rehabilitation settings. A strong advocate for culturally grounded, evidence-driven, and scalable models of care, Dr. Noushad promotes mental-health approaches tailored to low- and middle-income countries, ensuring that science-based interventions remain socially relevant, accessible, and sustainable.

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