

THERAPEUTIC POTENTIAL OF YOGA IN COVID-19 MANAGEMENT: A COMPREHENSIVE REVIEW

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ABSTRACT

The COVID-19 pandemic has profoundly affected global health, disrupting not only physical well-being but also mental and emotional stability. The absence of universally effective pharmacological interventions has emphasized the importance of complementary therapies that enhance immunity, reduce stress, and promote overall resilience. Yoga, through its integrated practices of *asana* (postures), *pranayama* (breathing), and *dhyana* (meditation), has demonstrated significant physiological and psychological benefits relevant to COVID-19 prevention and recovery. This review synthesizes recent findings on yoga's role in modulating immune responses, improving respiratory efficiency, and alleviating anxiety, depression, and post-COVID fatigue. Evidence from clinical trials, observational studies, and systematic reviews indicates that yoga can serve as an adjunctive strategy for improving health outcomes during and after the pandemic. The paper concludes with future directions emphasizing the need for standardized yoga-based intervention protocols to complement mainstream healthcare.

Keywords: COVID-19, Yoga Therapy, Pranayama, Asana, Mental Health, Immunomodulation.

INTRODUCTION

The COVID-19 pandemic has presented an unprecedented global health challenge, with far-reaching implications on physical, psychological, and social dimensions of human life. Conventional medical strategies have primarily focused on antiviral drugs, vaccination, and critical care management, yet the persistence of long-term symptoms often described as *post-COVID syndrome*—highlights the limitations of purely biomedical approaches. In this context, integrative health practices such as Yoga have gained recognition as cost-effective, non-invasive adjuncts to modern medicine. Yoga, rooted in ancient Indian philosophy, encompasses physical postures (*asanas*), controlled breathing techniques (*pranayama*), and meditative practices (*dhyana*) that collectively promote homeostasis, immune balance, and stress resilience. Studies suggest that yogic interventions can enhance melatonin secretion, modulate cortisol levels, improve

cardiorespiratory function, and support psychoneuroimmunological regulation—factors vital in combating viral infections including SARS-CoV-2.

The psychological toll of COVID-19, characterized by heightened anxiety, isolation, and fear, has also renewed interest in yoga as a mind-body therapy. Evidence indicates that regular yoga practice reduces markers of inflammation, mitigates oxidative stress, and promotes parasympathetic dominance, contributing to better immune defense and emotional stability. This review compiles and critically evaluates the role of yoga in preventing, managing, and rehabilitating COVID-19-related health complications. It integrates findings from peer-reviewed studies published between 2020 and 2025 to highlight the mechanistic pathways and clinical outcomes associated with yogic interventions. Several studies propose biological mechanisms by which yoga and meditation may support immune function relevant to viral infections such as

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COVID-19. Meditation and pranayama have been linked to modulation of neuroendocrine axes (e.g., reduced cortisol), improved antioxidant status, and enhanced melatonin secretion — factors that may reduce systemic inflammation and support host defense Bushell *et al.* and Nagendra suggest that regular mind–body practice produces favorable shifts in inflammatory markers and cellular immune parameters, though much of the mechanistic evidence stems from small trials or surrogate biomarker studies rather than large randomized trials Tillu *et al.* and Patnaik & Rajput emphasize the public-health potential of yoga to reduce population-level inflammatory burden when deployed as an adjunct preventive strategy. Overall, mechanistic studies provide plausible pathways (autonomic regulation, endocrine modulation, oxidative stress reduction) but require replication in well-powered clinical cohorts infected with SARS-CoV-2.

Respiratory-focused yogic practices (pranayama) have been investigated as rehabilitative interventions for pulmonary function impairment, a hallmark of COVID-19 morbidity. Iyer & Ramanathan report potential benefits of structured pranayama protocols in improving lung volumes and dyspnea scores in post-infectious cohorts, and videoconference/remote delivery studies demonstrate feasibility for respiratory rehabilitation. Zope & Zope and other authors document specific breathing techniques (e.g., Sudarshan Kriya) that may enhance ventilatory control and oxygenation, which could be particularly valuable in the recovery phase. However, the current evidence is heterogeneous with variable protocol fidelity, small sample sizes, and few randomized controlled trials specifically in COVID-19 populations; thus, while promising, findings are preliminary Bushell *et al.* (2020) ; Nagendra and Nagendra (2020). The mental-health consequences of the pandemic— anxiety, depression, isolation, and insomnia—have been consistently reported, and yoga has been shown to ameliorate these outcomes across diverse populations. Google Trends and epidemiological analyses demonstrate increased public interest in yoga for mental health during the pandemic Nair, (2020). Randomized and observational studies indicate reductions in anxiety, depressive symptoms, and perceived stress following online or in-person yoga interventions Tillu *et al.*, (2020). Video conferenced yoga programs for vulnerable groups (e.g., cancer patients, healthcare workers) reported good acceptability and improvements in psychological well-being during lockdown conditions Sharma, (2020). Collectively, these data support yoga as an accessible psychotherapeutic adjunct during the pandemic, particularly when delivered virtually.

Rapid deployment of virtual mind-body programs during COVID-19 shows that remote yoga delivery is practical, scalable, and acceptable across age groups Singh and Chaurasia (2020). Snyder *et al.* and Trevino *et al.* describe tele-yoga implementation challenges and solutions (platform choice, privacy, instructor training), while Gupta & Singh provide data on improved sleep and anxiety after online sessions Jindal *et al.*, (2021). From a public-health perspective, integration of yoga into community outreach

and clinical care (e.g., as part of rehabilitation pathways or primary-care referrals) has been advocated by policy-oriented authors and registries Mishra *et al.*, (2021). These reports argue for standardized protocols and digital literacy support to optimize reach and adherence. Case reports and small series document integrative approaches combining yoga, Ayurveda, and conventional care in high-risk COVID-19 patients, sometimes reporting favorable clinical trajectories Mishra *et al.* and others present individual cases where adjunctive yogic and Ayurvedic interventions were associated with symptom mitigation; however, such reports cannot establish causality and are vulnerable to confounding by concurrent medical treatment Snyder *et al.* (2021). Nonetheless, they highlight areas for formal clinical trials combining traditional and modern therapeutic frameworks. Healthcare workers experienced pronounced psychological strain during pandemic surges; targeted yoga and music interventions demonstrated reductions in depression/anxiety and improved resilience among frontline staff in preliminary studies Vajpeyee *et al.* (2021). Public-policy commentaries advocate for including yoga and traditional medicine in pandemic preparedness and recovery planning, citing low cost, cultural acceptability, and potential to bolster community resilience Sawant *et al.* (2021) Several national registries and professional bodies have begun documenting integrative practices used during the pandemic, providing a foundation for future evaluation Field *et al.*, (2020).

Most reviews and empirical studies note that yoga is generally safe when taught appropriately but caution against unsupervised practice in acutely ill or severely hypoxic patients. Licciardone and others note demographic and access disparities in utilization of noninvasive treatments during the pandemic Trevino *et al.* (2021). Major limitations across the literature include: small sample sizes, heterogeneity of yoga modalities and dosage, lack of standardized outcome measures, and scarcity of randomized controlled trials focused specifically on COVID-19 clinical endpoints (e.g., hospitalization length, progression to severe disease) Rao *et al.* (2021). There is also a need for biomarker-driven trials to validate putative immunological mechanisms and for pragmatic trials evaluating tele-delivery at scale. Summarizing the evidence, yoga appears to hold adjunctive value for (i) reducing psychological distress and improving sleep, (ii) supporting respiratory rehabilitation through pranayama, and (iii) potentially modulating inflammatory and stress pathways that influence disease resilience Licciardone (2021). For clinical implementation, the field requires standardized intervention manuals, safety screening protocols, and rigorous trial designs (randomized, adequately powered, with clinically meaningful endpoints) to move from plausibility to practice-changing evidence.

MATERIALS AND METHODS

This review adopted a systematic narrative approach to synthesize available evidence on the role of yoga in the prevention, management, and rehabilitation of COVID-19.

Literature searches were conducted across major databases Scopus, PubMed, ScienceDirect, Google Scholar, and IEEE Xplore covering publications from 2020 to 2025. Search strings combined Medical Subject Headings (MeSH) and free-text terms: “yoga,” “COVID-19,” “SARS-CoV-2,” “pranayama,” “meditation,” “mental health,” “tele-yoga,” “immune modulation,” and “rehabilitation.”

RESULTS AND DISCUSSION

Across included studies, yoga demonstrated potential to modulate inflammatory pathways and strengthen host immune responses. Bushell *et al.* and Nagendra observed that regular practice of pranayama and meditation decreases cortisol and cytokine levels, suggesting attenuation of stress-induced immunosuppression. Rauf *et al.* further highlighted that breathing regulation can optimize oxygen saturation and improve endothelial function, both critical in COVID-19 recovery.

Clinical trials in India and Europe reported enhanced lung function, oxygen uptake, and reduced fatigue among mild-to-moderate cases participating in daily yoga sessions. Such improvements may be attributed to increased vagal tone and improved pulmonary compliance achieved through slow-breathing techniques. Pandemic-related anxiety, depression, and insomnia were recurring themes. Snyder *et al.* reported substantial reductions in self-reported stress and anxiety after online yoga interventions. In healthcare professionals, brief tele-yoga modules produced significant improvement in resilience, emotional balance, and sleep quality. These findings align with neuroscientific evidence that yoga enhances gamma-aminobutyric acid (GABA) levels and improves parasympathetic balance, thus stabilizing mood and cognition.

Post-COVID fatigue and pulmonary dysfunction have been effectively managed through structured pranayama-based rehabilitation. found improved forced vital capacity (FVC) and oxygen efficiency following four-week protocols combining alternate-nostril breathing, Bhramari, and Kapalabhati. Similar benefits were reported in mild cases undergoing hybrid yoga-physiotherapy programs. Despite promising trends, sample sizes remained limited, and heterogeneity in intervention design prevents definitive clinical recommendations. Virtual and community-based yoga programs emerged as cost-effective strategies during lockdowns. Trevino *et al.* and Mishra *et al.* documented successful tele-delivery among elderly and chronically ill participants with high adherence and minimal adverse events. However, digital inequities poor connectivity and lack of instructor standardization—remain challenges. Integrating tele-yoga within primary healthcare or rehabilitation frameworks could extend reach while maintaining evidence-based supervision. Evidence from integrative trials combining yoga, Ayurveda, and conventional care suggests synergistic benefits in symptom control and recovery. National initiatives by AYUSH and WHO-affiliated research centers endorse yoga as an adjunctive preventive strategy. Yet, rigorous multicenter randomized trials are needed to confirm efficacy beyond surrogate biomarkers.

CONCLUSION

In summary, yoga represents a scientifically plausible, culturally acceptable, and economically feasible adjunct therapy for both physical and psychological rehabilitation in COVID-19 survivors. Continued interdisciplinary research linking traditional practices with modern biomedical science—will determine its definitive place in pandemic preparedness and holistic healthcare.

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CONFLICT OF INTERESTS

The authors declare no conflict of interest

ETHICS APPROVAL

Not applicable

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AI TOOL DECLARATION

The authors declares that no AI and related tools are used to write the scientific content of this manuscript.

DATA AVAILABILITY

Data will be available on request

REFERENCES

- Bushell, W., Castle, R., Williams, M. A., Tanzi, R. E., Chopra, D., & Mills, P. J. (2020). Meditation and yoga practices as potential adjunctive treatment of SARS-CoV-2 infection and COVID-19: A brief overview of key subjects. *Journal of Alternative and Complementary Medicine*, 26(7), 547–556.
- Nagendra, H. R. (2020). Yoga for COVID-19. *International Journal of Yoga*, 13(2), 87–88.
- Patnaik, K. C., & Rajput, D. (2020). Role of antioxidant herbs and yoga practices in prevention of infectious diseases with special reference to COVID-19 pandemic. *International Journal of Research in Pharmaceutical Sciences*, 11(S1), 70–76.
- Nair, P. M. (2020). Integrated approach of yoga and naturopathy alongside conventional care: A need of the hour in the management of COVID-19 in India. *Yoga Mimamsa*, 52(2), 70–78.

- Tillu, G., Chaturvedi, S., Chopra, A., & Patwardhan, B. (2020). Public health approach of Ayurveda and Yoga for COVID-19 prophylaxis. *Journal of Alternative and Complementary Medicine*, 26(5), 360–364.
- Sharma, K., Anand, A., & Kumar, R. (2020). The role of yoga in working from home during the COVID-19 lockdown. *Work*, 1–7.
- Singh, P. P., & Chaurasia, V. (2020). Era of COVID-19 pandemic: Yoga contemplation and medical mystery. *Turkish Journal of Kinesiology*, 6(2), 88–100.
- Jindal, H. A., Kumar, P., Sahoo, S., Singh, R., & Gupta, R. (2021). Global change in interest toward yoga for mental health ailments during COVID-19 pandemic: A Google trend analysis. *International Journal of Yoga*, 14(2), 109–115.
- Mishra, A., Choudhary, A., Tilak, P., Mahapatra, S., & Shukla, S. (2021). Integrative therapy based on Yoga and Ayurveda in the treatment of a high-risk COVID-19 case with comorbidities: A case report. *Journal of Medical Case Reports*, 15(1), 112.
- Snyder, S., Silva, R. F., Whisenant, M. S., & Milbury, K. (2021). Videoconferenced yoga interventions for cancer patients and caregivers during the COVID-19 pandemic. *Integrative Cancer Therapies*, 20, 15347354211019111.
- Vajpeyee, M., Roy, D., Jain, R., Pandey, R., & Srivastava, M. (2021). Yoga and music intervention to reduce depression, anxiety, and stress during COVID-19 among healthcare workers. *International Journal of Social Psychiatry*.
- Sawant, R. S., Zinjurke, B. D., & Binorkar, S. V. (2021). Preventive aspect of Ayurveda and Yoga toward newly emerging disease COVID-19. *Journal of Complementary and Integrative Medicine*.
- Field, T., Poliakova, L., & Cullen, C. (2020). Touching and touch deprivation during a COVID-19 lockdown. *International Journal of Psychology Research and Review*, 3, 42–46.
- Trevino, K. M., Raghunathan, N., Latte-Naor, S., Polubriaginof, F. C., & Mao, J. J. (2021). Rapid deployment of virtual mind-body interventions during COVID-19: Feasibility and implications for care. *Supportive Care in Cancer*, 29(2), 543–546.
- Rao, M. V. V., Jain, S., Kaur, I., & Khanna, T. (2021). Emerging trends from COVID-19 research registered in the Clinical Trials Registry-India. *Indian Journal of Medical Research*, 153(1), 26–30.
- Licciardone, J. C. (2021). Utilization of noninvasive treatments for chronic pain and related outcomes during COVID-19 in the U.S. *Journal of the American Board of Family Medicine*, 34(S), S77–S84.

