



International Yoga Day 2026: Advancing Evidence-Based Yoga for Healthy Ageing, Holistic Health and Disease Prevention.

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ABSTRACT

The International Day of Yoga, observed annually on June 21st, highlights the growing global recognition of yoga as a holistic, preventive, and complementary healthcare practice. The 2026 theme, “Yoga for Healthy Ageing,” emphasizes the role of yoga as an evidence-based mind-body practice that supports functional ability, mental well-being, healthy longevity and better quality of life throughout the ageing process. Accumulating scientific evidence supports that yoga provides beneficial effects on healthy ageing, non-communicable diseases, cardiovascular health, diabetes, stress management, mental health, sleep quality, and overall well-being. Yoga exerts its effects through autonomic regulation, reduction of inflammation, enhancement of neuroplasticity, and improved emotional regulation. This short communication discusses the scientific basis, clinical relevance, and public health importance of yoga with special emphasis on healthy ageing.

Keywords: Yoga, Healthy ageing, International day of yoga, Integrative medicine, Public health, Non-communicable diseases. International Journal of Health Technology and Innovation (2026)

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INTRODUCTION

The International Day of Yoga, observed annually on June 21st, has emerged as a global platform for promoting health, wellness, and preventive healthcare. Since its adoption by the United Nations General Assembly in 2014, International Yoga Day has transcended cultural and geographical boundaries and has been promoted globally as a means of enhancing physical, mental and social well-being. The theme for International Yoga Day 2026, “Yoga for Healthy Aging”, is very apt given the rapid demographic transition occurring across the globe and the increasing need for strategies that support health, longevity and functional independence in older adults.^{1,2}

Population aging serves as one of the most significant public health challenges of the 21st century. Advances in healthcare, sanitation, and living conditions might have contributed to increased life expectancy; however, these gains have been accompanied by a growing burden of chronic diseases, frailty, disability, cognitive decline and mental health disorders. Consequently, contemporary healthcare systems are increasingly shifting their focus from merely extending lifespan to improving health-span - the period of life spent in good health, functional independence, and social engagement.

In this context, interventions that simultaneously focus on physical, psychological, and social determinants of health are becoming increasingly important.

Yoga, an ancient Indian mind-body discipline, offers a holistic strategy to health promotion and disease prevention. Traditionally, yoga encompasses physical postures (asanas), breathing exercises (pranayama), meditation, relaxation techniques, and mindfulness practices. Although rooted in age-old philosophical traditions, yoga has increasingly become the subject of rigorous scientific investigation. Over the past two decades, a growing body of evidence has demonstrated beneficial effects of yoga across a wide range of health outcomes, including cardiovascular health, metabolic function, musculoskeletal fitness, mental well-being, sleep quality and quality of life.^{1,3-6}

Unlike conventional exercise modalities that primarily target physical fitness, yoga addresses multiple dimensions of health simultaneously. Through the combination of movement, breath regulation, and mindful awareness, yoga may influence physiological, psychological, and behavioral pathways associated with health and disease. This multidimensional nature makes yoga particularly relevant for aging populations, who frequently experience complex interactions among

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physical illness, emotional distress, cognitive changes, and social isolation.

The increasing global morbidity burden of non-communicable diseases (NCDs) further underscores the importance of preventive approaches such as yoga. Cardiovascular disease, diabetes mellitus, obesity, chronic respiratory disease, and mental health disorders account for the majority of deaths worldwide and are strongly influenced by modifiable risk factors. Consequently, lifestyle medicine and integrative healthcare approaches have received growing attention as strategies for reducing disease burden and improving long-term health outcomes.^{1,7}

This short communication examines the scientific evidence supporting yoga as a complementary intervention for healthy ageing and disease prevention. Emphasis is placed on its physiological mechanisms, benefits for physical and mental health, implications for healthcare systems, and potential contribution to public health initiatives aimed at promoting healthy ageing.

OBJECTIVES

The objective of this short communication is to summarize current evidence regarding the role of yoga in promoting healthy ageing, preventing non-communicable diseases, improving mental health and supporting public health initiatives in the context of the International Day of Yoga 2026. The article also aims to discuss the biological mechanisms underlying the health benefits of yoga and highlight future directions for research and policy.

METHODS

This article presents a narrative overview of the current scientific evidence regarding yoga and healthy aging. The article is based on published literature, including umbrella reviews, systematic reviews, meta-analyses, randomized control trials, and records from the World Health Organization. The selected literature was used to summarize current evidence and the effects of yoga on healthy aging, non-communicable diseases, mental health, physiological mechanisms, and public health, with emphasis on evidence relevant to the theme of International Yoga Day 2026.

Yoga and healthy ageing

Healthy ageing is more commonly recognized as a multidimensional process involving maintenance of physical capacity, cognitive function, emotional well-being, social participation, and independence. The World Health Organization emphasizes that healthy ageing should focus not only on the absence of disease, but also on preserving functional ability and quality of life throughout older age. Within this framework, yoga offers several advantages because it simultaneously addresses physical, psychological, and social domains of health.^{2,8}

Several studies have shown that regular yoga practice improves flexibility, balance, mobility, muscular strength, and postural stability among older adults.^{8,9} These findings

are specifically important because falls remain a major cause of injury, hospitalization, disability, and mortality in ageing populations. Improved balance and proprioception resulting from yoga practice may help reduce falls while enhancing confidence in performing activities of daily living.

Frailty, characterized by reduced physiological reserve and increased vulnerability to stressors, is another major concern among older adults. Emerging evidence suggests that yoga-based interventions may improve physical performance, endurance, and resilience, potentially slowing the progression of frailty.^{1,10} Furthermore, yoga practices can be adapted to individual capabilities, making them suitable for elderly people with diverse levels of physical fitness and functional limitation.

Beyond physical health, yoga may contribute to cognitive and emotional well-being. Ageing is often associated with declines in memory, attention, and executive function, as well as increased risk of anxiety, depression, and loneliness. Mindfulness and meditation practices incorporated within yoga may enhance attention regulation, emotional resilience, and psychological well-being.^{10,11} Group-based yoga programs may additionally promote social engagement and reduce feelings of isolation, thereby contributing to healthy ageing from both psychological and social perspectives.

Physiological and neurobiological mechanisms underlying the benefits of yoga

The growing acceptance of yoga within healthcare systems has stimulated considerable interest in understanding biological mechanisms responsible for its therapeutic effects. Unlike many conventional interventions that target a single physiological pathway, yoga appears to influence multiple interconnected systems simultaneously. This multidimensional impact may explain its broad applicability across diverse clinical conditions and age groups.

One among the most extensively studied mechanisms is the regulation of the autonomic nervous system. Modern lifestyles are frequently associated with chronic stimulation of the sympathetic nervous system, often referred to as the “fight or flight response”. Persistent sympathetic overactivity contributes to hypertension, cardiovascular disease, anxiety, sleep disturbances, metabolic dysfunction, and impaired immune responses. Yoga practices, particularly pranayama and meditation, have been shown to reduce sympathetic activity while enhancing parasympathetic or vagal tone, thereby restoring autonomic balance.^{9,12,13}

Heart rate variability (HRV), a recognized marker of autonomic function and cardiovascular resilience, has consistently been reported to improve following yoga interventions. Higher HRV is linked with greater adaptability to physiological and psychological stressors, reduced cardiovascular risk, and improved overall health outcomes. The enhancement of HRV observed among yoga practitioners provides objective evidence supporting yoga’s role in promoting resilience and healthy aging.⁹

Another important mechanism involves regulation of the hypothalamic-pituitary-adrenal (HPA) axis. Chronic stress

activates this pathway, resulting in sustained secretion of cortisol and other stress hormones. Elevated cortisol levels have been linked to obesity, insulin resistance, hypertension, immune dysfunction, depression, and accelerated biological ageing. Several studies, including meta-analyses, have demonstrated reductions in cortisol concentrations following regular yoga practice, suggesting improved stress regulation and enhanced physiological recovery.^{11,14}

Inflammation represents another key route through which yoga may exert beneficial effects. Chronic low-grade inflammation is increasingly identified as a central contributor to ageing and the development of non-communicable diseases. Elevated levels of inflammatory biomarkers such as C-reactive protein, interleukin-6 and tumor necrosis factor-alpha have been associated with cardiovascular disease, diabetes, frailty, neurodegenerative disorders and depression. Research suggests that yoga-based interventions may reduce systemic inflammation and improve immune regulation, thereby potentially mitigating the age-related disease process.^{1,14}

Recent advances in molecular biology have provided further understanding of the effects of yoga on cellular ageing. Studies suggest that yoga and meditation may influence biomarkers of cellular ageing, including oxidative stress markers, telomerase activity, and antioxidant capacity. Improvements in antioxidant status and reductions in oxidative stress have been reported among long-term yoga practitioners, raising the possibility that yoga may contribute to healthier biological aging.⁸

Neuroscientific investigations have also revealed significant effects of yoga on brain structure and function. Neuroimaging evaluations have demonstrated changes in several brain regions involved in attention, emotional regulation, memory, and self-awareness, including the hippocampus, prefrontal cortex, amygdala, and anterior cingulate cortex. These findings are particularly relevant because age-related cognitive decline and neurodegenerative disorders represent major public health concerns.

Yoga has furthermore been associated with increased levels of gamma-aminobutyric acid (GABA), an inhibitory neurotransmitter that plays a vital role in regulating anxiety, mood, and stress responses.¹² Reduced GABA activity has been implicated in anxiety disorders, depression, and chronic stress. Enhanced GABAergic activity following yoga practice may therefore contribute to improved emotional well-being and mental health outcomes.

Collectively, these physiological and neurobiological mechanisms provide a plausible scientific explanation for the broad spectrum of health benefits associated with yoga. Importantly, many of these mechanisms directly address processes involved in ageing, including chronic inflammation, autonomic dysfunction, oxidative stress, neurodegeneration, and impaired stress resilience. This evidence supports the growing recognition of yoga as a scientifically grounded intervention capable of contributing to healthy ageing and disease prevention.

Yoga and non-communicable disease prevention.

Non-communicable diseases (NCDs) account for approximately three-quarters of all global deaths and represent a major challenge to healthcare systems worldwide.¹⁵ Cardiovascular illnesses, diabetes mellitus, chronic respiratory diseases, cancer, and mental health disorders are responsible for substantial morbidity, mortality, and healthcare expenditure. Most NCDs share common risk factors including physical inactivity, obesity, unhealthy dietary habits, tobacco use, poor sleep, and chronic stress. Consequently, interventions capable of addressing multiple lifestyle-related determinants simultaneously have considerable public health value.

Yoga has evolved as one such intervention. An umbrella review of systematic reviews and meta-analyses published in 2025 reported significant benefits of yoga across several chronic conditions, including improvements in blood pressure, glycemic control, depressive symptoms, anxiety levels, fatigue and health-associated quality of life.¹ These findings support the role of yoga as a complementary strategy within lifestyle medicine and integrative healthcare.

Cardiovascular health is among the most extensively studied areas of yoga research. Regular yoga practice has been associated with reductions in systolic and diastolic blood pressure. Meta-analyses have reported average reductions of approximately 5-8mmHg in systolic blood pressure and 3-5 mmHg in diastolic blood pressure among individuals practicing yoga regularly, changes that are considered clinically meaningful for cardiovascular risk reduction. There were also improvements in lipid profiles and endothelial function, and better autonomic regulation.^{1,9} Since hypertension remains one of the leading modifiable risk factors for cardiovascular disease, these findings are of substantial clinical significance.

Similarly, yoga appears to be beneficial for individuals with type 2 diabetes mellitus. Systematic reviews have demonstrated improvements in fasting blood glucose, glycated hemoglobin (0.4-0.7%), insulin sensitivity, and body mass index following yoga interventions.⁴ Stress reduction, improved sleep quality, increased physical activity and enhanced self-care behaviors may collectively contribute to these metabolic benefits.

Obesity and metabolic syndrome, which are increasingly prevalent among both younger and older populations, may also be positively influenced by yoga. Although yoga may not expend energy at levels comparable to vigorous aerobic exercise, its ability to improve mindfulness, dietary awareness, emotional regulation, and stress management may support sustainable lifestyle modification and weight management.

Furthermore, yoga has demonstrated benefits in respiratory disorders, musculoskeletal conditions, breast cancer survivorship, and chronic pain syndromes.^{1,7} The broad applicability of yoga across diverse healthcare conditions underscores its potential role as a complementary intervention within comprehensive disease prevention and health promotion strategies.

Yoga and mental health in the era of healthy ageing

Mental health is an integral component of healthy ageing.

Older adults frequently experience psychological challenges, including anxiety, depression, loneliness, bereavement, sleep disturbances, and social isolation. These conditions not only diminish quality of life but also contribute to increased morbidity, healthcare utilization, and mortality. Consequently, interventions that support emotional well-being and psychological resilience are increasingly recognized as essential components of healthy aging strategies.

Yoga has demonstrated considerable promise in promoting mental health across diverse populations. Meta-analyses and systematic reviews have consistently reported reductions in symptoms of anxiety, depression, perceived stress, and psychological distress among individuals participating in yoga-based interventions.^{3,10,11} The combination of mindful movement, breathing regulation, relaxation and meditation appears particularly effective in addressing both physiological and psychological aspects of stress.

Mindfulness practices integrated within yoga encourage present-moment awareness and nonjudgmental observation of thoughts and emotions. These practices may reduce rumination, improve emotional regulation, and enhance psychological flexibility. Such benefits are particularly relevant for older adults coping with age-related transitions, chronic illness, and social challenges.

Sleep disturbances are another common concern among the ageing population. Poor sleep is associated with impaired cognitive function, increased cardiovascular risk, depression, and reduced quality of life. Evidence suggests that yoga interventions can improve sleep duration, sleep quality, and subjective sleep satisfaction through relaxation of the nervous system and reduction of stress-related autonomic hyperactivation.^{11,14}

The COVID-19 pandemic further highlighted the significance of mental health promotion. Social isolation, uncertainty, and disruptions in daily routines contributed to increased psychological stress across age groups. During this period, yoga emerged as an accessible and adaptive intervention that could be practiced both in person and through digital platforms, demonstrating its potential to support mental well-being even during periods of restricted social interaction.

Yoga in healthcare workers and medical education

Healthcare professionals are particularly vulnerable to stress, burnout, compassion fatigue, and emotional exhaustion. Heavy workloads, long working hours, administrative demands, and exposure to suffering contribute to psychological distress among physicians, nurses, and healthcare workers. Burnout not only affects individual well-being but may also compromise patient care, professional satisfaction and healthcare system performance.

Various studies have illustrated the beneficial effects of yoga-based interventions among healthcare professionals. Improvements in perceived stress, emotional exhaustion, sleep quality, mindfulness and overall well-being have been reported following yoga programs.¹⁶ By promoting self-awareness,

emotional regulation, and resilience, yoga may function as an effective component of institutional wellness initiatives.

Medical students represent another high-risk group. Academic pressure, competitive environments, frequent examinations, and concerns regarding future careers contribute to elevated levels of stress and anxiety. Research suggests that yoga and mindfulness-based interventions can improve psychological well-being, concentration, and emotional resilience among students.¹⁰

The integration of yoga into medical education may offer additional benefits. Exposure to evidence-based complementary therapies can enhance future physicians' understanding of integrative healthcare approaches while simultaneously supporting their own well-being. Such initiatives align with contemporary efforts to promote physician wellness and reduce burnout within healthcare systems.

Public health implications of yoga

The significance of yoga extends beyond individual health outcomes. International Yoga Day has transformed yoga into a global public health movement that promotes awareness of preventive healthcare, healthy lifestyles and holistic well-being. The annual observance provides an opportunity to engage communities, educational institutions, healthcare organizations, and policymakers in discussions surrounding health promotion and disease prevention.

Yoga poses several characteristics that make it particularly attractive from a public health perspective. It is relatively inexpensive, requires minimal equipment, can be adapted to different age groups and health conditions, and can be delivered in community settings. These attributes are especially valuable in resource-constrained environments where access to healthcare services may be limited.

The World Health Organization's mYoga initiative represents a significant step towards promoting safe, standardized and evidence-based yoga practices globally.² Such initiatives may facilitate broader dissemination of yoga while ensuring quality and safety. Community-based yoga programs, workplace wellness initiatives, school-based interventions, and healthy ageing campaigns may all contribute to reducing the burden of chronic disease and improving population health.

The theme "Yoga for Healthy Ageing" also aligns closely with global healthy ageing initiatives promoted by international organizations. As populations continue to age, sustainable interventions that preserve functional ability, enhance quality of life, and reduce healthcare costs will become increasingly important. Yoga has the potential to contribute meaningfully to these objectives.

Public health strategies for widening the reach of yoga

Although yoga originated in ancient India and was traditionally associated with spiritual and philosophical practices, contemporary research increasingly recognizes yoga as a scientifically supported mind-body intervention that is applicable across diverse age groups, cultures, and

socioeconomic settings. While yoga may facilitate personal growth and spiritual development for individuals who seek such benefits, its health-promoting effects are accessible to all members of society, regardless of religious, cultural, or spiritual beliefs. This broader perspective should be adopted by all sections of society at national as well as international levels to further strengthen the global acceptance of yoga as a complementary approach to health promotion, disease prevention, and healthy ageing.

Expanding the reach of yoga to rural, underprivileged, and underserved populations requires a coordinated, community-based approach supported by healthcare systems, education institutions, and public health agencies. Community yoga programs conducted through primary health centers, health and wellness centers, schools, community halls, and village-level organizations can significantly improve accessibility, particularly in rural settings where participation in yoga practices has traditionally been lower than in urban areas. [17]

Training community health workers, ASHAs, Anganwadi workers, and local volunteers in basic yoga instruction can facilitate sustainable dissemination of yoga practices at the grassroots level. Integrating yoga into existing health promotion and non-communicable disease prevention programs may further enhance its reach among vulnerable populations. Delivering yoga instruction in local languages and adapting practices to cultural context can improve acceptance and participation. Free or subsidized yoga camps organized through government agencies, non-governmental organizations, and community groups can help overcome financial barriers.

The use of digital platforms, mobile applications, community radio, and tele-yoga services may extend access to geographically remote areas, particularly among older adults and individuals with limited access to conventional wellness services.¹⁸ Specially designed yoga programs for older adults, women, persons with disabilities, and individuals with chronic diseases can ensure inclusiveness and equity. Workplace yoga initiatives targeting agricultural workers, self-help groups, and informal sector employees may further broaden participation.

Collaboration among healthcare professionals, educators, local governments and community leaders can strengthen awareness and foster long-term engagement. Finally, continuous monitoring and evaluation of community yoga initiatives and evidence-based research are essential.

Future directions for research

Despite encouraging evidence, several important research gaps remain. Small sample sizes, heterogeneous methodologies, short follow-up periods, and variability in intervention protocols have limited many studies evaluating yoga interventions. Standardization of yoga interventions remains a challenge because yoga encompasses diverse practices that may differ considerably in intensity, duration, and content.

Future research should prioritize large multicenter randomized controlled trials with adequate statistical power and long-term follow-up. Such studies would help to clarify the effectiveness of yoga across different populations and

health conditions. Research examining cost-effectiveness, implementation strategies, and integration into healthcare systems would also be valuable.

Advances in neuroscience, molecular biology, and systems medicine offer opportunities to further elucidate the biological mechanisms underlying yoga's effects. Understanding these mechanisms may facilitate the development of targeted interventions and strengthen acceptance of yoga within evidence-based healthcare.

Additionally, research specifically focused on healthy ageing is warranted. Studies examining the impact of yoga on frailty, cognitive decline, dementia risk, functional independence, and healthy longevity may provide important insight into its role in supporting ageing populations.

DISCUSSION

The present review highlights growing evidence supporting yoga as an effective complementary intervention for healthy aging and prevention of non-communicable diseases. The observed benefits are consistent with findings from recent umbrella reviews, systematic reviews, and meta-analyses demonstrating improvements in cardiovascular risk factors, metabolic health, mental well-being, sleep quality, physical function, and quality of life.^{1,3,4,7} These beneficial effects appear to result from multiple interconnected mechanisms including autonomic regulation, reduction in chronic inflammation, improved neuroplasticity, enhanced emotional regulation, and healthier lifestyle behaviors.¹¹⁻¹⁴

Despite encouraging evidence, several limitations should be acknowledged. Considerable heterogeneity exists among published studies with respect to yoga styles, intervention duration, frequency, outcome measures, and participant characteristics, making direct comparisons difficult. Many studies have relatively small sample sizes and short follow-up periods, while blinding is inherently difficult in behavioral interventions. Consequently, although the overall evidence supports beneficial effects, Additional high quality multicenter randomized control trials with standardized intervention protocols are needed.^{1,7}

From a clinical and public health perspective, yoga represents a low-cost, accessible, and adaptable intervention that can complement conventional healthcare for healthy aging and chronic disease prevention. Integration of evidence-based yoga programs into primary healthcare, community health promotion, workplace wellness initiatives, and healthy aging programs may contribute to reducing the burden of chronic diseases while improving quality of life.^{2,7,15} Future research should focus on long-term effectiveness, cost-effectiveness, implementation strategies, and development of standardized clinical guidelines for incorporating yoga into evidence-based integrated healthcare.^{1,7}

CONCLUSION

The International Day of Yoga 2026, with its theme "Yoga for Healthy Ageing", highlights the growing importance of holistic and preventive approaches to healthcare. Increasing scientific

evidence supports the role of yoga as a complementary intervention capable of improving physical health, mental well-being, functional capacity, and quality of life across the lifespan. Through its effects on autonomic regulation, stress reduction, inflammation, neuroplasticity, and emotional resilience, yoga addresses several key determinants of healthy ageing.

Beyond individual benefits, yoga offers important opportunities for public health promotion, disease prevention, and healthcare cost reduction. Its accessibility, adaptability, and relatively low cost make it suitable for implementation across diverse settings and populations. As healthcare systems increasingly emphasize preventive and person-centered care, yoga may serve as a valuable component of integrative health strategies.

On the occasion of International Yoga Day 2026, the medical community should recognize yoga not only as an important component of India's cultural heritage, but also as a scientifically supported practice with substantial potential to promote healthy ageing, enhance well-being, and enhance quality of life. Continued research, interdisciplinary collaboration, and evidence-based implementation will be essential to fully realize its contribution to global health.

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