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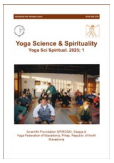

New Electronic Journal Yoga Science & Spirituality

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Abstract

BACKGROUND: Yoga Science & Spirituality is launched to deepen public understanding of scientific yoga and its spiritual dimensions. Modern yoga's popularity has grown, yet its traditional foundations and identity are increasingly diluted.

AIM: To present scientific research on yoga's therapeutic, educational, and spiritual potential, reinforce core yogic principles, and honor contributors to the field of Scientific Yoga.

METHODS: The journal gathers and disseminates studies by yoga researchers and teachers, integrates perspectives from holistic disciplines, and documents historical and contemporary contributions to Scientific Yoga.

RESULTS: Growing scientific interest reveals yoga's measurable psycho-physical and spiritual benefits. The journal provides a platform for evidence-based insights while promoting the preservation of yoga's original principles, including Yama and Niyama.

CONCLUSION: By combining scientific inquiry with traditional yogic values, the journal aims to safeguard yoga's authentic essence and highlight its cultural and civilizational significance.

Dear Reader,

It is my pleasure to present to you the inaugural issue of the electronic journal Yoga Science & Spirituality. This journal is an attempt to create and expand the culture of yoga, especially Scientific Yoga and its spiritual component, in order to make it more understandable to a wider audience.

Our intention is to bring forward the work of yoga researchers and teachers, to share their scientific studies, and to shed light on the phenomenon of yoga. We seek to highlight the therapeutic potential of yoga and its growing role in the integrative processes of modern medicine. In addition, we hope to open a window toward other holistic therapeutic disciplines such as Ayurveda, Bach essences, herbal medicine, homeopathy, and more.

Half a century ago, we were still struggling in the West—particularly in the eastern part of the Western world—to justify the image and legitimacy of yoga. Although much has changed since then, we continue to encounter prejudice, criticism, and negativity even today.

In the meantime, many things have indeed changed, and one of them is yoga itself. Today we are witnessing a paradox: a discipline once regarded as a secret science, accessible only to a select few initiates, has now become widespread and enjoys remarkable popularity.This is one side of the picture.On the other hand, the once strict rules governing learning, teachers, and students have almost disappeared, bringing yoga to a point where its true identity is often questioned. To prevent yoga from losing its original essence, as outlined by Reishi Patanjali and other traditional texts, we must return to the core principles of Yama and Niyama—often overlooked by modern instructors. Both teachers and students need to recognize Yoga as a holistic educational system for the body, mind, and spirit.

Science, which previously approached yoga with considerable reservation, has in recent years begun to show a deep and objective interest in uncovering its hidden therapeutic, educational, and

spiritual potentials. In everyday life, it is not what we think, assume, or believe that matters. The truth is something entirely different, and the path to it is not always easy or quick. One way is through the direct practice of Yoga itself—when a person engages in it and experiences the results on a psycho-physical and spiritual level, it becomes a lived truth. The other way is through science, which, with its modern capabilities and instruments, enables us to see what Yoga is truly capable of achieving within the human being.

Alongside the publication of scientific research, this journal takes upon itself the task of preserving the memory of individuals—both past and present—who have contributed to the field of Scientific Yoga, and to offer them the recognition they deserve.

Spirituality stands prominently in the title of this journal because we acknowledge its immense civilizational value and its essential role—past, present, and future—in shaping the cultural development of our world. From a scientific perspective, spirituality represents the frontier at the margins of human knowledge—still undiscovered, still undecoded.

This electronic journal traces its roots to the modest internal Yoga Bulletin of the Yoga Society Skopje, first published in January 1983. Over time, that bulletin evolved into a brochure and eventually a regular magazine.

I would like to wish all members of the new editorial board great success in fulfilling their tasks.

I would also like to express my heartfelt gratitude to Prof. Dr. Mirko Spiroski for his initiative and support in making this publication possible.

At the end of one year and the beginning of another, I would like to wish you:

Happy New Year! Success in your professional activities, good health and harmony in your family life, and a joyful path in science and yoga!

Pavlos K. Hassanagas,

Editor-in-Chief,
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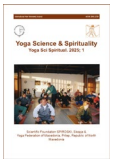

Published Papers about Yoga in the Scopus Database (2025)

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Abstract

BACKGROUND: Contemporary scientific research has demonstrated that yoga exerts measurable effects on numerous physiological systems, including autonomic regulation, immune activity, neuroendocrine balance, and musculoskeletal functioning

AIM: The aim of this study was to present current state of indexed papers about yoga in the Scopus database in order to understand the connection of yoga with science and spirituality.

METHODS: A search of the Scopus database was performed on November 07, 2025, in order to identify published papers from the yoga documents in all fields of Scopus. A total number of 71,875 documents were found. All documents were included in the analysis of the number of published documents about yoga.

RESULTS: First document about yoga was published in 1904 with very small increase of published papers till 2003. From 2003 to 2005 there is very big increase in the indexed papers in the Scopus database with more than 8K papers published in 2025. On the first place of the number of published documents about yoga in the Scopus database is International Journal of Environmental Research and Public Health, followed by the journals Frontiers in Psychology, and Plos One. In most of the published papers there is no author ID found. The biggest number of published papers about yoga relates to the author Cramer, H. (201 papers). Harvard Medical School published the biggest number of papers connected with yoga. Most of published documents about yoga in the Scopus database published researchers from United States, India, United Kingdom, China, and Australia. Published papers from the former Yugoslav republics about Yoga are on the lower part of the scale with Croatia on the first place, followed with Serbia, Slovenia, Bosnia and Herzegovina, Montenegro, and North Macedonia. Most of the published papers about yoga are articles with the subject area medicine. International Journal of Yoga Therapy is the only journal devoted to yoga and indexed in Scopus database.

CONCLUSION: The number of publications included in Scopus database from the field of yoga continuously was present from1904 with the sharp increase between 2003 and 2025 year.

Introduction

Yoga represents one of the oldest and most influential systems for understanding the human mind, body, and spirit. Originating in the Indian subcontinent, Indus Valley, Harappan culture more than 5,000 years ago (steatite seals which was uncovered in Mohenjo-daro around 2600 BC), yoga evolved as a holistic discipline integrating physical training, breath regulation, ethical principles, and contemplative practices aimed at achieving inner balance and transcendence of ordinary consciousness [1], [2]. Historically, yoga was preserved in classical texts such as the *Upanishads*, the *Bhagavad Gītā*, and Patañjali's *Yoga Sūtras*, each offering systematic frameworks for self-cultivation, moral development, and spiritual liberation [3]. Over the last century, yoga has undergone a profound global transformation, expanding from a primarily spiritual tradition to a multidisciplinary field studied within psychology, neuroscience, public health, and integrative medicine [4], [5], [6].

The first scientific yoga institutions in the world were The Yoga Institute in Santacruz, Mumbai, founded in 1918 by Yogi Sri Yogendra Ji, as well as the Kaivalyadhama Yoga Institute and Research Centre in Lonavla, founded by Swami Kuvalayananda in 1924. A significant role in modernizing the image of yoga was played by T. Krishnamacharya (1888-1989).

Over time, following the initiatives of scientific centers that conducted research, the organization of scientific gatherings and congresses began. The first congress on Yoga and Ayurveda, held in the Republic of San Marino from June 8 to 11, 1985, was led by the congress president, Prof. K. N. Udupa from Banaras Hindu University, with secretary general Georgio Barabino, after which other international congresses followed. After Udupa's death, the position of president was assumed by Prof. Dr. Stibor Dostalek, who was also the vice-president of the Czechoslovak Academy of Sciences and a professor at Charles University. With the estabishment of the World Federation of Yoga and Ayurveda, global collaboration was further strengthened. Such events represent an excellent opportunity for exchanging new insights and contemporary research related to the benefits of yoga World Federation of Yoga, Ayurveda and Holistic Medicine.

Contemporary scientific research has demonstrated that yoga exerts measurable effects on numerous physiological systems, including autonomic regulation, immune activity, neuroendocrine balance, and musculoskeletal functioning [7], [8]. Neuroimaging studies have shown that regular yoga and meditation practices modulate neural circuits involved in attention, emotional regulation, and self-referential processing, particularly within the prefrontal cortex, insula, and default mode network [9], [10], [11].

These findings support long-standing yogic claims that disciplined mental training reshapes patterns of awareness and fosters states of sustained clarity, equanimity, and introspection [12]. From a biomedical standpoint, yoga is now increasingly incorporated into clinical interventions for managing stress, anxiety, depression, chronic pain, hypertension, psychosomatic, metabolic disorders and in prenatal and postnatal education [13], [14], [15].

Equally important is yoga's philosophical and spiritual dimension, which addresses existential questions concerning consciousness, suffering, and human flourishing. Yogic spirituality emphasizes the cultivation of ethical living (*yama* and *niyama*), the harmonization of body and mind, and the realization of one's deeper nature (*ātman*) as interconnected with a greater universal reality (*brahman*) [16], [17]. Unlike dogmatic systems, yoga privileges direct experiential knowledge (*pratyakṣa*) through introspection and meditative absorption. This experiential orientation has positioned yoga as a bridge between ancient contemplative traditions and modern scientific inquiries into the nature of consciousness, subjective experience, and well-being [18], [19].

The emerging field of contemplative science seeks to integrate empirical research with these rich spiritual traditions. Scholars argue that yoga provides a comprehensive model for understanding human potential, combining evidence-based practices with ethical frameworks that encourage compassion, self-awareness, and psychological resilience [20], [21]. As global interest in holistic and integrative health continues to grow, yoga stands at the intersection of science and spirituality, offering tools not only for disease prevention and mental health but also for cultivating purpose, meaning, and self-transcendence.

The aim of this study was to present current state of published papers about yoga in the Scopus database in order to understand the connection of yoga with science and spirituality.

Material and Methods

A search of the Scopus database was performed on November 07, 2025, in order to identify published papers from the yoga documents in all fields of Scopus. A total number of 71,875 documents were found. All documents were included in the analysis of number of published documents about yoga: by year, by the first 20 journals, by the first 20 authors, by the first 20 institutions – affiliations, by the first 20 countries, by the former Yougoslav countries, by the type, and by subject area.

Results

The analysis of yoga documents published and indexed in Scopus database is presented by the original analysis of the documents from the Search and Analysis of the results (November 07, 2025).

Distribution of the published documents about Yoga in the first 20 journals is presented on Table 1. On the first place is International Journal of Environmental Research and Public Health (610 papers), followed by Frontiers in Psychology (600 papers), and Plos One (519 papers). On the 20th place is Frontiers in Public Health with 198 published papers.

Table 1: Number of published documents about Yoga in the Scopus database in the first 20 journals (2025)

SOURCE TITLE	Number of published papers
International Journal of Environmental Research and Public Health	610
Frontiers in Psychology	600
Plos One	519
Journal of Alternative and Complementary Medicine	419
Mindfulness	402
Complementary Therapies in Medicine	358
Cochrane Database of Systematic Reviews	311
Complementary Therapies in Clinical Practice	310
Scientific Reports	310
Journal of Ayurveda and Integrative Medicine	280
Religions	272
Evidence Based Complementary and Alternative Medicine	264
Frontiers in Psychiatry	260
Journal of Bodywork and Movement Therapies	252
Supportive Care in Cancer	250
BMJ Open	230
International Journal of Yoga Therapy	221
Healthcare Switzerland	212
Journal of Clinical Medicine	206
Frontiers in Public Health	198

Documents published by year show that first document about yoga was published in 1904 with very small increase till 2003. From 2003 to 2005 there is very big increase in the indexed papers in the Scopus

database with more than 8K papers published in 2025 (Figure 1a).

The number of published documents about Yoga in the Scopus database by the first 20 authors is shown in Figure 1b. We can see that the most of published papers (513 papers) there is no author ID found. The biggest number of published papers about yoga is connected with Cramer, H. (201 papers), following with Telles, S. (181 papers), Yoganandan, N. (155 papers), Nagendra, H.R. (142 papers), and Nagarathna, R. (107 papers).

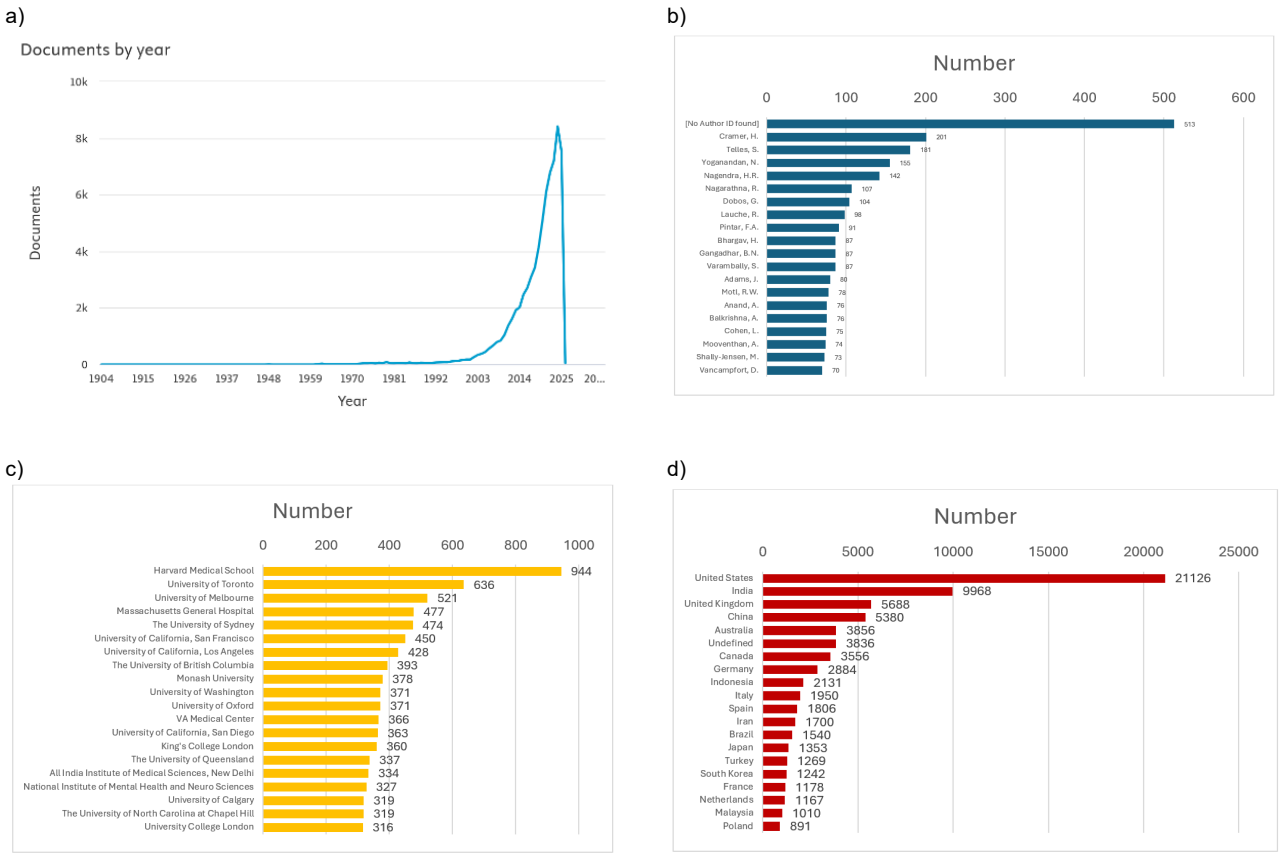

Figure 1: Published documents about Yoga in the Scopus database: a) by year (2025); by the first 20 authors; c) by the first 20 institutions – affiliations; d) by the first 20 countries

The number of published documents about yoga in the Scopus database by the first 20 institutions – affiliations is shown in Figure 1c. The biggest number of published articles about yoga is published by the Harvard Medical School (944 papers), followed with University of Toronto (636 papers), University of Melbourne (521 paper), Massachusetts General Hospital (477 papers), and University of Sydney (474 papers).

The number of published documents about Yoga in the Scopus database by the first 20 countries have shown that the biggest number of published papers were published by the researchers from United States (21,126 papers), followed by the India (9,968 papers), United Kingdom (5,688 papers), China (5,380 papers), and Australia (3,856 papers). On the 20th place is Poland with the 891 published papers (Figure 1d).

The number of the published papers from the former Yugoslav republics about Yoga are on the lower part of the scale with Croatia on the first place (122 papers), following with Serbia (118 papers), Slovenia (107 papers), Bosnia and Herzegovina (38 papers), Montenegro (10 papers), and North Macedonia with 7 papers (Figure 2).

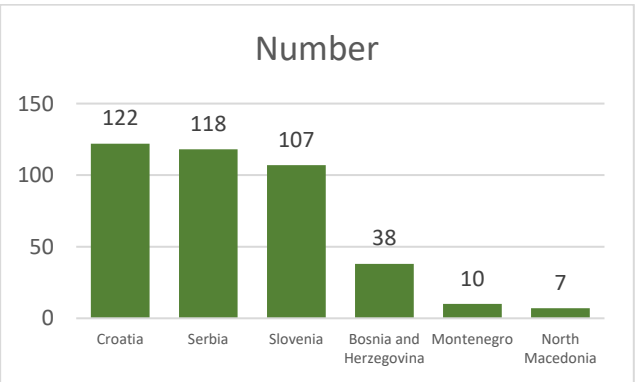

Figure 2: Number of published documents about Yoga in the Scopus database by the former Yugoslav countries (2025)

Most of the published papers about Yoga are articles (60.2%), followed with the review papers (17.6%), Book Chapters (9.4%), Conference Papers (4.5%), Books (4.1%) and others (Figure 3a).

Subject area Medicine took first place (31.5%), in the second place are Social Sciences (10.5%), the third place belongs to Psychology (8.5%) and other areas are less than 8.0% (Figure 3b).

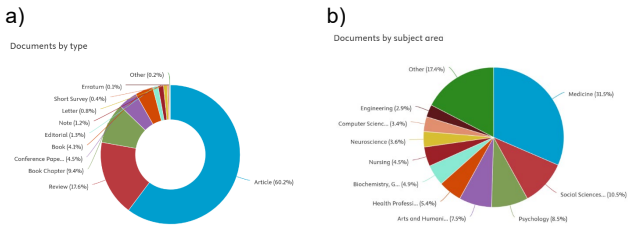

Figure 3: Number of published documents about Yoga in the Scopus database: a) by the type; b) by subject area (2025)

International Journal of Yoga Therapy (ISSN: 1531-2054, eISSN: 2168-5835, published by International Association of Yoga Therapists, United States) is the only journal devoted to yoga and indexed in Scopus database. The journal was included in Scopus from 2011-2013 and from 2016-2025. This is Q2 journal with CiteScore 2024 of 1.7, SJR 2024 of 0.357, SNIP 2024 of 0.384, and Hirsh Index 2024 of 21 (Figure 4).

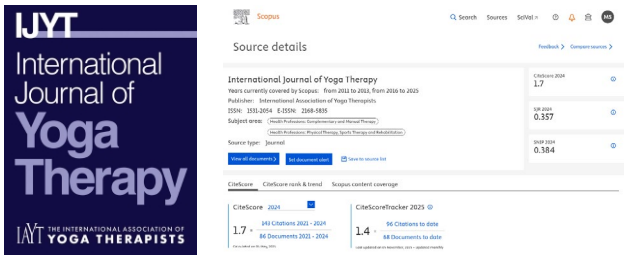

Figure 4: Scientific journal about Yoga investigations indexed in the Scopus database (2025)

Discussion

The present analysis of yoga-related documents indexed in the Scopus database provides the most comprehensive overview to date of global research productivity, disciplinary trends, and institutional contributions in the field of yoga science. Several important patterns emerge from bibliometric results, reflecting the rapid evolution of yoga from a primarily philosophical and spiritual discipline to a multidisciplinary scientific domain spanning medicine, psychology, neuroscience, public health, and integrative health sciences [1], [4], [22], [23].

Growth of Yoga Research Since the Early 2000s

The temporal distribution of publications demonstrates that yoga research remained minimal for nearly a century after the first published paper in 1904. A dramatic expansion occurred beginning around 2003–2005, followed by exponential annual growth, exceeding 8,000 publications in 2025. This surge parallels the global rise of complementary and integrative medicine research, as well as increased interest in mind–body interventions within clinical and neuroscientific contexts [24], [25], [26].

Several factors likely contributed to this inflection point: (a) the spread of modern postural yoga worldwide; (b) the establishment of research institutions dedicated to yoga therapy in India and the United States; (c) increased funding for non-pharmacological and lifestyle-based interventions; and (d) growing recognition of yoga as a low-cost, evidence-supported approach to stress reduction and chronic disease management [27], [28], [29]. The observed trend is consistent with bibliometric analyses showing steep increases in research output on meditation, mindfulness, and other contemplative practices during the same period [30], [31].

Journals and Research Visibility

The distribution of publications across journals reveals that yoga research is disseminated primarily through multidisciplinary outlets rather than yoga-specific journals. The *International Journal of Environmental Research and Public Health* (610 papers), *Frontiers in Psychology* (600 papers), and *PLOS One* (519 papers) are the most prolific, collectively accounting for a substantial proportion of all yoga-indexed documents. These journals are known for broad thematic scopes and acceptance of health-related and behavioral science research, suggesting that yoga is increasingly studied as a public health and psychological intervention [32], [33], [34].

First yoga journal on scientific research was "Yoga-Mimamsa" from Kaivalyadhama Institut, Lonavla, India. But only one specialized journal—*International Journal of Yoga Therapy*—is indexed in Scopus. Despite its relatively modest output, its Q2 ranking and stable scientometric indicators (CiteScore 2014 = 1.7; SJR 2014 = 0.357) indicate sustained recognition of yoga therapy as a legitimate clinical field [35]. The dominance of non-specialized journals further suggests that yoga research is deeply embedded within larger discourses of lifestyle medicine, stress physiology, mental health, and integrative care.

Authors and Institutions

Authorship analysis confirms that yoga research is shaped by a combination of established academic researchers and a large proportion of publications without identifiable author IDs—likely conference papers, institutional reports, or publications with incomplete metadata. Among identifiable authors, Cramer, H. (201 papers), Telles, S. (181 papers), Yoganandan, N. (155 papers), Nagendra, H.R. (142

papers), and Nagarathna, R. (107 papers) dominate the field.

Many of these authors are associated with major yoga research centers in India (e.g., S-VYASA, NIMHANS) or with institutions specializing in integrative medicine and mind–body research [36], [37], [38]. Their sustained output underscores the importance of dedicated research ecosystems combining laboratory facilities, clinical operations, and educational programs centered on yoga and related therapies.

Institutionally, Harvard Medical School leads with 944 papers, followed by the University of Toronto, University of Melbourne, Massachusetts General Hospital, and the University of Sydney. These institutions are global leaders in public health, psychiatry, oncology, and rehabilitation sciences—areas where yoga-based interventions have accumulated strong evidence [39], [40], [41]. Their involvement is likely reflecting the integration of yoga into clinical research on chronic pain, supportive cancer care, psychiatric conditions, and preventative health.

Regional Disparities

The United States contributes the largest share of yoga publications (21,126 papers), followed by India (9,968 papers), the United Kingdom, China, and Australia. This distribution correlates with the geographic expansion of modern yoga and the prominence of mind–body research programs in North America and Western Europe [42], [43]. India's position as the birthplace of yoga and host of many traditional and modern research institutions naturally contributes to its high productivity. The strong presence of China is notable and likely related to its rapidly expanding integrative medicine infrastructure and comparative studies between yoga and traditional Chinese practices such as qigong and tai chi [44].

In contrast, countries from the former Yugoslav region show comparatively low publication output, with Croatia (122 papers), Serbia (118 papers), and Slovenia (107 papers) leading modestly, and Macedonia producing the fewest publications (7 papers). This regional gap may reflect more limited institutional funding, fewer dedicated complementary medicine research centers, and less integration of yoga into national health or academic systems. Similar patterns have been documented in bibliometric analyses of other complementary therapies in Southeastern Europe [45].

Document Types

Most yoga documents are research articles (60.2%) and reviews (17.6%), confirming the dominance of empirical and evidence-based scholarship. Book chapters (9.4%) and books (4.1%) indicate ongoing scholarly interest in theoretical, historical, and philosophical dimensions of yoga, while conference papers (4.5%) reflect active participation in international academic networks.

The subject-area distribution is led by Medicine (31.5%), followed by Social Sciences (10.5%) and Psychology (8.5%). This disciplinary composition is consistent with the modern reconceptualization of yoga as a therapeutic, behavioral, and psychosocial intervention rather than solely a spiritual or religious practice [10], [46], [47]. Fields such as neuroscience, rehabilitation, nursing, and psychiatry increasingly examine yoga's mechanisms and effects on neuroplasticity, stress pathways, autonomic regulation, and mental health outcomes [7], [48], [49].

Future of Yoga Research

The sustained rise in yoga publications and their diversification across disciplines indicate that yoga has achieved stable scientific legitimacy within the global research community. The breadth of research—from molecular biomarkers and brain imaging to epidemiology, education, and spirituality—suggests yoga's potential as a comprehensive biopsychosocial-spiritual approach to health [21], [50]. However, the dominance of Western institutions and the relative underrepresentation of smaller countries such as those in the Balkans highlight the need to support emerging regions through collaborative networks, training programs, and dedicated funding.

Future research may benefit from:

- expanding randomized controlled trials and mechanistic studies;
- research in the field of categorization, systematization, and standardization of the educational profile of teachers, as well as the curricula of general education—but especially in yoga therapy and specialized educational programs in yoga for children and youth, for various professional profiles, for children with special needs, for athletes, astronauts, and similar groups. The aim is to prevent incompetence, improvisation, and superficiality.
- standardizing yoga interventions and reporting guidelines;
- strengthening cross-cultural research, especially between India and Western institutions;
- addressing publication biases toward clinical and quantitative studies;
- increasing representation from under-studied regions.

Conclusions

Overall, the bibliometric findings confirm that yoga research is transitioning from a niche area into a global interdisciplinary field with substantial scientific, medical, and societal relevance.

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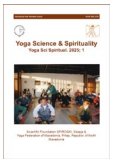

Science Studies Yoga: A Review of Physiological Data by James Funderburk, PhD

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Abstract

Science Studies Yoga: A Review of Physiological Data by James Funderburk represents a significant scholarly contribution to the scientific understanding of yoga. The book critically examines yoga not as a spiritual or philosophical system, but as a subject of empirical investigation grounded in modern physiology. Drawing on experimental studies, clinical observations, and laboratory measurements, Funderburk reviews physiological data related to yogic breathing, meditation, relaxation, and physical postures. The work systematically analyzes the effects of yoga on key physiological systems, including respiration, cardiovascular function, metabolism, and neural activity, with particular attention to indicators such as heart rate, blood pressure, oxygen consumption, brain wave patterns, and autonomic nervous system responses. Emphasizing methodological rigor, the author carefully discusses the limitations of existing studies, including small sample sizes and lack of standardization, thereby presenting yoga research as an evolving scientific field. By integrating perspectives from physiology, psychology, and neuroscience, the book bridges Eastern contemplative practices and Western biomedical science and anticipates later developments in mind–body medicine. Overall, the work establishes yoga as a legitimate area of physiological research and provides a foundational reference for scholars and healthcare professionals interested in evidence-based approaches to mind–body practices.

Publication date: 1977

Topics: Hatha yoga -- Physiological aspects

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Science Studies Yoga: A Review of Physiological Data by James Funderburk represents an important scholarly effort to examine yoga through the lens of modern scientific inquiry. Rather than approaching yoga as a purely spiritual or philosophical tradition, the author focuses on empirical research and physiological evidence to evaluate the effects of yogic practices on the human body. With an introduction by Barbara B. Brown, a respected researcher in psychophysiology, the book situates itself firmly within an academic and interdisciplinary framework that bridges Eastern practices and Western science.

The primary objective of the book is to review and synthesize available physiological data related to yoga, particularly studies concerning breathing techniques, meditation, relaxation, and physical postures. Funderburk adopts a critical and analytical approach, examining research findings from experimental studies, clinical observations, and laboratory measurements. This scientific orientation distinguishes the work from more popular or instructional yoga texts and positions it as a resource for researchers, healthcare professionals, and students interested in the measurable effects of mind–body practices.

Structurally, the book is organized in a clear and systematic manner. It begins by outlining the historical and conceptual background necessary to understand yoga within a scientific context. Funderburk acknowledges the ancient origins of yoga while emphasizing the need for objective analysis and methodological rigor. This introductory discussion prepares the reader for the central sections of the book, which focus on physiological systems such as respiration, cardiovascular function, metabolism, and neural activity. Each section reviews relevant studies and discusses how yogic practices may influence these systems.

The content of the book includes the following chapters:

- muscular-articular responses to Hatha yoga,
- circulatory responses to Hatha yoga,
- respiratory responses to Hatha yoga,
- endocrine and nervous system responses to Hatha yoga
- general physiological responses to meditation.

One of the book's major strengths lies in its emphasis on empirical evidence. Funderburk carefully examines physiological indicators such as heart rate, blood pressure, oxygen consumption, brain wave activity, and autonomic nervous system responses. By referencing experimental data, the author demonstrates that yoga can produce measurable changes in bodily functioning, particularly in relation to stress reduction and relaxation responses. The discussion of altered states of consciousness and biofeedback, reinforced by Barbara B. Brown's introduction, further strengthens the scientific credibility of the work.

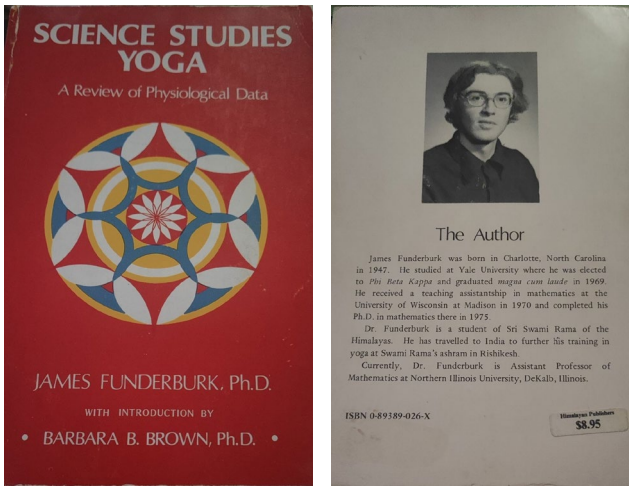

Figure 1: Cover page and author of the book Science Studies Yoga: A Review of Physiological Data by James Funderburk, Ph.D.

The author maintains a balanced and cautious tone throughout the book. Rather than making exaggerated or definitive claims about the benefits of yoga, Funderburk consistently highlights the limitations of existing studies. He addresses issues such as small sample sizes, lack of standardized methodologies, and difficulties in isolating specific variables within complex yogic practices. This critical perspective enhances the academic value of the book, as it encourages readers to view yoga research as an evolving field rather than a settled body of knowledge.

Another important contribution of the book is its interdisciplinary relevance. Science Studies Yoga intersects with fields such as physiology, psychology, neuroscience, and preventive medicine. By framing yoga as a subject worthy of scientific investigation, Funderburk challenges traditional divisions between Eastern contemplative practices and Western biomedical models. This approach anticipates later developments in mind–body medicine and integrative health, making the book historically significant as well as academically relevant.

Despite its strengths, the book also has certain limitations. Some of the studies discussed reflect the scientific standards and technological constraints of the period in which the book was written. As a result, readers familiar with contemporary neuroscience or medical research may find the data somewhat dated. Additionally, the text is highly analytical and may be challenging for readers without a background in physiology or scientific methodology. However, these limitations do not undermine the book's core contribution; rather, they highlight the need for continued research and updated studies in the field.

In conclusion, Science Studies Yoga: A Review of Physiological Data is a rigorous and insightful examination of yoga from a scientific perspective. James Funderburk succeeds in presenting yoga as a legitimate subject of physiological research while maintaining a critical and evidence-based approach. The book is particularly valuable for academics, researchers, and practitioners interested in the scientific foundations of yoga and mind–body practices. By emphasizing empirical data and methodological caution, the work contributes meaningfully to the academic discourse on yoga and its role in health and human performance.

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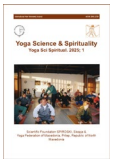

Overview of Yoga Therapy

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Abstract

BACKGROUND: During the early 1990s, yoga was still widely misunderstood and burdened by cultural and scientific prejudices, particularly in the context of healthcare. Only a limited number of open-minded researchers explored its therapeutic potential. Since then, yoga—especially Hatha Yoga—has gradually gained scientific and clinical recognition as a complementary approach to health and disease management.

AIM: To present a reflective and conceptual overview of yoga therapy as a holistic health approach, contrasting its principles with conventional medical models and emphasizing its therapeutic, philosophical, and lifestyle dimensions.

METHODS: This work is based on a narrative, philosophical, and experiential analysis of yoga therapy, grounded in classical yoga texts, long-term practical experience, and historical perspectives on the development of therapeutic yoga. Comparative conceptual analysis between medical and yogic views of illness and healing is employed.

RESULTS: Yoga therapy views the human being as an integrated physical, energetic, and psycho-mental entity. Classical Hatha Yoga techniques—including asanas, pranayama, kriyas, relaxation, and meditation—demonstrate inherent therapeutic effects when applied through individualized, progressive, and carefully adapted programs. Unlike conventional medicine, yoga therapy emphasizes active patient participation, personal responsibility, lifestyle modification, and mental transformation alongside physical practice.

CONCLUSIONS: Yoga therapy represents an integrative and holistic approach to health that complements modern medicine without claiming to be a universal cure. Its value lies not only in symptom management but also in fostering awareness, acceptance, resilience, and conscious living. The growing volume of scientific publications on yoga, particularly in medical and psychological fields, supports its increasing relevance and integration into contemporary healthcare models.

Introduction

The text that follows was written and published in a brochure titled “YOGA – A Natural Path to a Healthy Heart” in 1993 [1]. I emphasize the year — a period of 32 years ago — because only with that context can we understand the spirit of the time: a period in which thoughts and attitudes toward yoga were heavily influenced by the prejudices that existed then, and which left a deep and negative mark on that era [2].

Only a small number of scientists, those with an open mind, were willing to listen and explore the benefits of yoga and felt motivated to direct their scientific and research curiosity toward studies in the field of yoga [3]. I remember that time very clearly, as well as earlier periods in which scientific attempts to approach yoga could be counted on the fingers of one hand [4]. It is of great importance that these rare events be mentioned and remembered, even if only from a historical perspective.

The text below is my view of that time.

Yoga is a philosophical and educational system that helps people reconnect with their true nature [5]. Through yoga, we explore our inner world and gain the opportunity to understand and fulfill the purpose of our existence, a process known in yoga as self-realization [6]. Even the oldest yoga texts mention that yoga can support people dealing with health issues [7]. They especially emphasize the power of Hatha Yoga techniques [8]:

- Viyāyama – Preparatory Techniques;
- Asanas – Psycho-somatic Static and Dynamic Postures;
- Pranayama – Breathing Technique;
- Kriyas (Shatkarmas) – Cleansing

Techniques;
• Relaxation Techniques;
• Meditation – Psycho-mental Techniques [8], [9].

All these techniques help in controlling and even overcoming illness [10].

Yoga isn't therapeutic just because we adapt it for that purpose, its very nature, especially the practices of Hatha Yoga, carries a healing effect [8], [11]. This therapeutic aspect is one of the most impactful parts of yoga. Because of this, yoga has gained respect and acceptance, especially in the Western world. Some of its effects have been so striking that they changed the minds of people who were once skeptical or critical of yoga [12].

For this reason, we have always focused on therapeutic yoga in our work. Over the years, we've gained extensive practical experience, both through individual cases, people who joined our courses on their own or through a doctor's recommendation, and through specialized research programs conducted within our school.

Illness in Medicine vs. Yoga Therapy

A human being is a complex structure, and yoga views people differently than conventional medicine [13]. Yoga sees the individual as a whole and this difference in perspective shapes how illness is understood and treated in yoga therapy, compared to medical practice [14]. This is also why holistic medicine today is seen as an essential reform in how we approach health and healing [15].

In yoga, a person is understood as an energetic being, something often overlooked in medical science [16]. This energetic aspect strongly influences the state of the body's physical functions. A person also has a unique psycho-mental constitution shaped by the four aspects of the mind (Antahkarana) [6]:

• Manas – the sensory–motor, lower mind;
• Buddhi – the intellect;
• Citta – memory;
• Ahamkara – the ego [6].

Depending on how well these functions operate (defined in yoga by the three Gunas: Sattva, Rajas, and Tamas), they determine the state of the mind, which together with the energetic component influences a person's overall health [7].

Illness (Vyadhi) is often the result of an unhealthy lifestyle, harmful habits, poor nutrition and stress [9]. It can also be influenced by inherited predispositions [15]. According to yoga philosophy, these factors are tied to karma, which plays a significant role in both the development of disease and the process of healing (6). At the same time, illness can also serve as a warning, a wake-up call to become aware of and change the direction of one's life [7].

Medicine tends to view the body in separate parts, as a collection of organs and functions. It often focuses on treating the symptoms rather than addressing the root cause, which may remain unknown. Another characteristic of medical treatment is that the patient is usually passive: they are expected to remain calm and follow instructions, while the doctor acts as the primary agent of healing [15].

In yoga therapy, the opposite approach is taken. The yoga instructor gives guidance and shows the person what they need to do for themselves [11]. In this way, the individual by consciously taking responsibility for himself takes an active role in their own healing process [14].

Characteristics of Yoga Therapy

Yoga therapy is defined by several important components. It's well known that the same techniques are used for both healthy and ill individuals, there is no strict separation between the two. However, the approach changes: the pace, intensity, and combination of techniques are adapted according to the nature and stage of the illness [10]. Based on this, the techniques are organized progressively, and a personalized program is created. The duration of the techniques differs between the regular program and the specialized program. Contraindications for the specific illness are taken very seriously, as well as any additional personal health issues the individual may have. Naturally, this can only be done by a skilled yoga instructor [11].

Beyond the physical techniques, it's important to become aware of the philosophical and spiritual dimensions of yoga, because yoga is not just a set of exercises [5]. Still, we need to realize that yoga is not a religion. Yoga is not a ritual but a method of awareness, a path of self-improvement [6].

To overcome illness, we must shift how we observe and understand things [14]. It's not enough to simply treat the symptoms; a person must also recognize the causes of the illness and the mistakes in their behavior. When people are healthy and feel well, they often become arrogant or indifferent. They start to believe they are untouchable, that what happens to others could never happen to them. This is why, when illness appears, it often comes as a shock [7].

In yoga therapy, changing one's mindset is essential, while the physical benefits come through regular practice [10].

Yoga therapy doesn't work only with the body; it works with the mind as well [6]. Beyond the physical

techniques and their effects through consistent practice, yoga should also be understood as a lifestyle aligned with the laws of nature and the state of one's inner world [5].

Yoga can help us manage certain illnesses by allowing us to face them more clearly [12]. But it should not be viewed as a cure for everything [11]. Some illnesses cannot be easily overcome. Yoga teaches us how to accept illness, how to live with it, and how to accept ourselves under new circumstances [14]. In doing so, we avoid becoming "twice sick": once from the physical condition itself, and a second time from the psychological distress caused by knowing that we are ill [12].

Currently (2025) the published papers about yoga in the Scopus Database with the subject area medicine are in first place (31.5%), in the second place are social sciences (10.5%), the third place belongs to psychology (8.5%) and other areas are less than 8.0% [17].

Conclusions

Yoga therapy represents a comprehensive and integrative approach to health that is rooted in ancient philosophical principles while remaining relevant to contemporary healthcare needs. By viewing the human being as an interconnected physical, energetic, and psycho-mental whole, yoga therapy offers a fundamentally different perspective from conventional symptom-oriented medical models. The therapeutic potential of yoga does not arise from modification alone but is inherent in its classical practices, particularly those of Hatha Yoga, which aim to restore balance, awareness, and self-regulation at multiple levels of human functioning.

Through individualized, progressive, and carefully adapted programs, yoga therapy emphasizes personal responsibility, active participation, and conscious lifestyle change as central elements of the healing process. Beyond physical benefits, it fosters mental clarity, emotional stability, and acceptance, helping individuals not only to manage or alleviate illness but also to transform their relationship with health, disease, and life itself. Importantly, yoga therapy does not claim to be a universal cure; rather, it supports coping, adaptation, and inner resilience, thereby preventing additional psychological suffering associated with illness.

The growing volume of scientific publications on yoga, particularly within the medical, social science, and psychological domains, reflects increasing academic and clinical recognition of its relevance and applicability. This expanding evidence base supports the integration of yoga therapy into holistic health models and underscores its value as both a complementary therapeutic approach and a pathway toward greater self-awareness, responsibility, and well-being.

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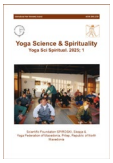

Yoga as a Method of Rehabilitation of Patients with Chronic Renal Insufficiency

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Abstract

BACKGROUND: Chronic renal insufficiency (CRI) leads to progressive physical, psychological, and social impairments, particularly in patients undergoing haemodialysis. Alongside medical treatment, complementary approaches aimed at improving adaptation, psychological balance, and quality of life are increasingly explored.

AIM: To evaluate the effects of a specialized, structured yoga program as a complementary component of integral rehabilitation in patients with CRI undergoing haemodialysis.

METHODS: A seven-month specialized yoga course (62 sessions, 60 minutes each) was conducted at a nephrology and dialysis institute. Twenty-four patients were enrolled, of whom five male patients completed the program. Psychosocial status was assessed using specially designed questionnaires (A1, A2) and the Cornell Index, while clinical condition was monitored through medical examinations, laboratory analyses, and clinical observation.

RESULTS: Improvements were observed within the first weeks to months of practice. All participants showed better tolerance of haemodialysis and diet, reduced muscle and joint pain, cramps, insomnia, headaches, and blood pressure instability, along with increased physical endurance. Psychological benefits included enhanced calmness, mood, self-confidence, and improved social interactions. Some laboratory parameters also improved, although confounding factors were present.

CONCLUSIONS: This pilot study suggests that a specialized yoga program is a feasible and potentially effective supportive therapy in the rehabilitation of haemodialysis patients with CRI, contributing to physical, psychological, and social well-being. Larger controlled studies are warranted to confirm these findings and establish evidence-based recommendations.

Introduction

Various chronic renal diseases may lead to a gradual decrease in renal function, resulting in the development of chronic renal insufficiency (CRI). The final stage in the development of CRI is uraemia, which is characterized by disorders affecting multiple organs and body systems, making survival impossible without dialysis or kidney transplantation [1]. Research on the psychological problems of patients with CRI began in the late 1950s, while the first psychiatric reports in the United States were published in the mid-1960s [2]. This was followed by a large number of studies addressing the psychological and social problems of such patients, conducted by nephrologists, psychiatrists, psychologists, and social workers [3], [4].

Over time, awareness of CRI-related problems and its treatment expanded among medical staff in nephrology centres as well as among patients' families [5].

The analysis of patients with CRI includes problems related to disease recognition and treatment, increased dependence on family members and dialysis machines, sexual activity, disturbances of body image, and restrictions imposed by the disease and its treatment [2], [3], [4]. Research focuses on life attitudes, emotional problems, and factors influencing adaptation to different therapeutic modalities, including conservative treatment, haemodialysis, peritoneal dialysis, and transplantation [3], [5]. It also addresses cognitive factors, such as intellectual efficiency and uraemia-related cognitive changes, as well as conative factors, including self-concept, body image, defence mechanisms, affects, attitudes, and value systems [2], [4]. Furthermore, the analysis includes patients' social

relationships, interactions with medical staff and family members, ability to adapt to therapy, and occupational and social rehabilitation [1], [2], [3], [4], [5].

Materials and Methods

The specialized yoga course for patients with chronic renal insufficiency (CRI) was conducted at the Institute for Nephrology, Dialysis and Rehabilitation in Struga. The course lasted seven months and consisted of 62 lessons, held three times per week, each lasting 60 minutes. This course was attended by 24 patients (19 men and 5 women). The group was inconsistent due to changes in dialysis centres, travel, and shorter stays at the Institute. For these reasons, the course was successfully completed by five patients, and the results and conclusions of this research are based on their participation and achieved outcomes.

In addition to patients, the course was attended by a physiotherapist, a physician, and other assisting medical personnel. In this research, specially prepared questionnaires were applied, including questionnaires A1 and A2, as well as the Cornell Index questionnaire for the assessment of psychoneurotic tendencies in patients [6].

Questionnaire A1 consisted of questions concerning problems experienced before the beginning of the yoga course, effects of applied yoga techniques, and other indicators related to the yoga program. Questionnaire A2 focused on patients' attitudes toward the disease, haemodialysis, and the difficulties encountered during treatment.

During the course, patients' health status and the effects resulting from the application of yoga exercises were regularly monitored through medical examinations, laboratory analyses, and clinical observation. Within the framework of integral rehabilitation of patients with CRI—particularly during the initial 1–6 months of haemodialysis treatment—a specialized program of yoga techniques was included [7], [8], [9], [11], [12], [13].

The specialized yoga program was prepared by yoga teacher Pavlos K. Hassanagas in cooperation with yoga instructor Irena Edrovska [7], [8]. The main goal of this first specialized yoga course for patients with CRI was to achieve psychological improvement and balance, with particular emphasis on dynamic and static relaxation techniques and breathing exercises [9], [10], [11], [12].

In addition, the program enabled physical recreation and rehabilitation through activation of the entire musculature, ligaments, joints, and internal organs. Due to the specific manner of exercising—slow, relaxed, with concentration and awareness of each movement—these exercises did not induce fatigue; on the contrary, they relieved muscular and joint tension, spasms, and pain characteristic of patients with CRI [7], [8], [9].

The program was designed to reduce the consequences of excessive tension, stress, anxiety, and other psychophysical problems, to strengthen the body, achieve psychophysical and mental relaxation and stability, and increase awareness of lifestyle, work, rest, and behaviour toward oneself, others, and the environment [8], [9], [10], [11], [12], [13]. At the same time, it served as an introduction to yoga, enabling patients to continue practice after returning home. In developing this specialized yoga program, particular attention was paid to the characteristics of CRI and the specific problems encountered by patients.

The specialized yoga program included the following components:

Relaxation techniques, enabling rapid physical relaxation, balancing nervous system activity, and reducing mental and physical tension; these techniques and the relaxed mode of practice constituted the core of the program [10], [11], [12].

Vyayama, consisting of basic preparatory psychophysical exercises aimed at re-education of locomotion, improvement of body awareness and control, activation of joints and muscles, enhancement of elasticity and circulation, strengthening of the body, and reduction of pain, spasms, and tension, while simultaneously enabling dynamic relaxation during performance [7], [8].

Pranayama, breathing techniques aimed at re-education of proper breathing patterns, enhancement of respiratory capacity, improved gas exchange, and induction of physical and mental calmness, positively influencing multiple body systems [7], [9], [13].

Kriyas, cleansing techniques supporting internal and external bodily hygiene and reducing unnecessary energy expenditure [7], [8].

Asanas, physical postures contributing to psychophysical stability, balancing of the nervous and endocrine systems, and activation and regulation of internal organ functions [7], [8], [9].

Results

The yoga course was successfully accomplished by 5 male patients with average age of 30.2. The average time of subordination to haemodialysis was 7.8 months. The average time of yoga practicing was 5 months.

The problems stated by these patients were characteristic and very similar from physical and psychological point of view: convulsions, irritation, neurosis, indifference, etc. The special problems they had, made their health condition even worse.

The first improvements based on subjective assessment of yoga effects, and the objective laboratory findings came up even during the first month of the practising, which can be seen on Table 1.

Table 1: Health problems before the specialized yoga course and improvements after the completion of the course

Patient	Sex	Age	Time on Dialysis	Duration of Yoga Practice	Improvement After	Difficulties (Before Yoga)	Specific Improvements	Common Improvements
I.B.	M	23	6 months (3 times weekly)	5 months	2 months	• Pain in legs and joints • Headaches • Nervousness • Fatigue • Fear • Lack of motivation	• Stabilization of body weight • Better tolerance of dialysis • Better tolerance of diet • Increased calmness • Improved social interactions	• Reduced muscle and joint cramps • Improved discipline regarding hygienic–dietary regimen • Increased physical endurance and activity
A.Č.	M	32	5 months (3 times weekly)	5 months	1 month	• Nervousness • Lack of motivation • Irritability	• Improved sleep • Stabilization of body weight • Reduction of headaches	—
I.I.	M	20	3 months (3 times weekly)	3 months	2 weeks	• Leg cramps • Irregular breathing • Nervousness	• Improved mood	—
I.S.	M	23	18 months (3 times weekly)	4 months	1 month	• Pain in arms • Digestive problems • Irritability • Insecurity • Fatigue • Depression • Lack of motivation • Nervousness	• Reduced insomnia • Improved flexibility	—
M.D.	M	53	7 months (2 times weekly)	3 months	1 month	• Back and leg pain • Cramps • Insomnia • High blood pressure	• Reduction of insomnia • Reduction of blood pressure	—

After the completion of the course, there can be seen common improvements for all the patients (Table 1), namely:

- better tolerance of dialysis;
- better tolerance of nutrition;
- enhanced calmness;
- improved contact with other people;
- diminished pains in the muscles and joints;
- increased physical condition and activity;
- regulation of the blood pressure;
- increased discipline towards the hygiene - dietetic regime.

Apart from these common improvements, some of the patients felt special improvements such as:

- better quality of sleeping;
- increased elasticity of the joints;
- stabilization of the body weight;
- diminished headaches (intensity and frequency).

Besides these improvements, there were improvements of the blood counts of the patients who attended the course, which can be seen from the laboratory findings, before and after the course. There is need for making additional, more precise research about contribution of yoga in improving the blood counts besides other factors such as: geographical and climate conditions in this area, transfusion, nutrition, particular medication, etc.

Because of the low educational level of patients, the Cornell index did not give real distribution of their neurotic tendencies. Because of the nature of the disease, they are too sensitive to their health condition. There is irregular distribution of the inner psychic forces with tendency to repress their own problems.

Discussion

Among the yoga literature and available scientific papers, we have not identified an organized approach to yoga practice specifically designed as a specialized program for patients with chronic renal insufficiency (CRI) [8], [13]. This initial pilot research on the application of yoga in the rehabilitation of patients with CRI does not possess statistical power; however, the observed outcomes merit serious consideration by medical professionals, as well as by yoga centres and institutes engaged in scientific research on yoga and its therapeutic applications [2], [3], [8].

The results appeared within a relatively short period, and with regular practice patients achieved improvements in overall health status and better tolerance of dialysis. Yoga practice can be performed independently of dialysis sessions and may help reduce problems associated with CRI. Nevertheless, it is particularly important for patients to begin practicing yoga within the framework of integral rehabilitation during the so-called adaptation period (1–6–12 months), in order to adjust to dialysis treatment and a new lifestyle [2], [3], [4], [5].

A key finding of this research is the positive influence of yoga on the psychological state and mood of patients. Yoga practice enables individuals to open themselves emotionally, develop self-awareness, and accept their condition while striving for personal improvement [2], [3], [10]. Most patients who attended

the course gradually changed their attitudes toward the disease. Inactivity, self-isolation, and lack of self-confidence were progressively reduced. Patients became more active, self-confident, and willing to re-establish social contacts, including offering support to other patients in more difficult situations [1], [2], [4].

The self-confidence, self-awareness, and mental balance achieved through yoga practice allowed patients to better accept themselves and others, resulting in improved relationships with family members, fellow patients, and medical staff [2], [3]. In addition to health rehabilitation, yoga also facilitated social rehabilitation, helping patients reintegrate into family and social environments, remain active, and avoid social isolation [1], [4], [5].

To successfully organize such research and courses and to ensure a high level of monitoring of the effects and outcomes of yoga techniques in the rehabilitation of patients with CRI, several conditions should be met. These include the formation of a multidisciplinary team, the establishment of experimental and control groups, adequate patient education, sufficient program duration, scheduling compatibility with dialysis, institutional and family support, systematic health monitoring, and comprehensive data analysis [1], [2], [3], [4], [5], [8].

Conclusions

The findings of this pilot study indicate that a specialized, structured yoga program can be a valuable complementary component of the integral rehabilitation of patients with chronic renal insufficiency undergoing haemodialysis. Despite the small number of patients who completed the course and the absence of statistical power, the observed consistent physical, psychological, and social improvements justify further systematic investigation.

Regular yoga practice was associated with improved tolerance of haemodialysis and dietary regimens, reduction of muscle and joint pain, cramps, insomnia, headaches, and blood pressure instability, as well as enhanced physical endurance and activity. Importantly, positive effects were observed relatively early, often within the first one to two months of practice, suggesting that yoga may contribute to faster adaptation to dialysis treatment.

Equally significant were the psychological and psychosocial benefits. Patients demonstrated increased calmness, self-confidence, emotional stability, and improved interpersonal relationships with family members, other patients, and medical staff. Yoga practice appeared to reduce inactivity and social withdrawal, supporting not only medical but also social rehabilitation and reintegration of patients with CRI.

The study also highlights the importance of early inclusion of yoga during the adaptation period of haemodialysis (first 1–6 months), when patients face substantial psychological stress and lifestyle changes. A slow, conscious, and non-fatiguing mode of exercise proved particularly suitable for this vulnerable patient population.

Although improvements in laboratory parameters were observed, their interpretation requires caution due to multiple confounding factors. Larger, controlled studies with standardized outcome measures are necessary to clarify the specific contribution of yoga to hematological and biochemical improvements.

In conclusion, this first experience with a specialized yoga program for patients with chronic renal insufficiency suggests that yoga is a safe, feasible, and potentially effective supportive therapy. Future research should include larger sample sizes, control groups, longer follow-up periods, and multidisciplinary collaboration to confirm these findings and establish evidence-based guidelines for the integration of yoga into renal rehabilitation programs.

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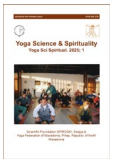

Yoga as a Complementary Method in Rehabilitation of Patients After Myocardial Infarction

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Abstract

BACKGROUND: Coronary arterial disease (CAD) is a leading cause of morbidity and mortality worldwide. Chronic psycho-emotional stress is recognized as a major risk factor influencing the onset, progression, and prognosis of CAD. Contemporary rehabilitation increasingly emphasizes stress reduction and lifestyle modification as part of secondary prevention.

AIM: To evaluate the effects of a specialized yoga program on stress reduction, modification of risk factors, and functional recovery in patients undergoing rehabilitation for coronary arterial disease.

METHODS: A prospective observational study was conducted in 514 patients with CAD who regularly attended specialized yoga courses during a one-month inpatient rehabilitation program. The intervention included relaxation techniques, vyayama, pranayama, kriyas, theoretical education, and supervised walks. Clinical status, cardiovascular functional parameters (EKG, echocardiography, treadmill stress test), correction of risk factors, and subjective physical and psychological outcomes were assessed using standardized examinations and questionnaires, including perceived stress scales.

RESULTS: After one month, patients showed a 20% improvement in overall functional cardiovascular capacity, with increases in exercise tolerance and oxygen consumption. Echocardiography demonstrated improvement in left ventricular function (EF +6%, FS +4%). Significant correction of risk factors was observed, particularly smoking (89.0%), psycho-emotional stress (73.8%), and arterial hypertension (76.7%). Subjectively, most patients reported improved physical condition, relaxation, reduced anxiety, better sleep quality, and enhanced stress resistance. A high proportion (78.2%) intended to continue yoga practice after discharge.

CONCLUSIONS: Specialized yoga programs appear to be a safe and effective complementary approach in the rehabilitation and secondary prevention of coronary arterial disease, primarily through reduction of chronic psycho-emotional stress and improved self-control, lifestyle awareness, and adherence to preventive measures. Although findings are encouraging, further long-term, controlled, and multicentric studies are required to confirm sustained cardiovascular benefits.

Introduction

Cardiovascular diseases, with ischemic heart disease (coronary arterial disease) as their leading representative, are among the most significant social and medical problems worldwide [1], [2]. Their epidemic spread over recent decades, with a tendency toward global expansion, affects all races, age groups, and professions, resulting in high morbidity, disability, and mortality, and posing serious medical, economic, and social challenges even for developed countries [1], [3].

Coronary arterial disease may manifest as stable angina pectoris, unstable angina pectoris (pre-infarction stage), acute myocardial infarction, sudden cardiac death, or asymptomatic myocardial ischemia [2], [4]. Any of these clinical manifestations may represent the initial presentation of the disease, with an increasing number of cases occurring in younger individuals during their most productive years [3].

Numerous epidemiological studies have demonstrated statistically significant associations between coronary arterial disease and major risk factors, including arterial hypertension, smoking, psycho-emotional stress, obesity, physical inactivity, hyperlipidemia, hyperglycemia, hyperuricemia, thrombotic tendency, and genetic predisposition [2], [4], [5]. Psycho-emotional stress and personality characteristics play a crucial role not only in the direct development of coronary disease but also in promoting other risk behaviors such as smoking, unhealthy diet, physical inactivity, and obesity [6].

Accordingly, developed countries place strong emphasis on primary prevention through national cardiovascular prevention programs focused on

elimination and modification of risk factors [3]. Similar principles are applied in secondary prevention and rehabilitation of patients with established coronary arterial disease [4], [5].

Chronic psycho-emotional stress has been identified as one of the most important predictors of early disease onset and unfavorable prognosis [7], [8], [9]. Numerous cardiological, psychological, and psychosomatic studies confirm the close association between stress and coronary arterial disease [8], [9]. Stress activates the hypothalamic–pituitary–adrenal axis, resulting in increased catecholamine secretion, elevated blood pressure, increased myocardial oxygen consumption, metabolic disturbances, neurovegetative imbalance, electrolyte shifts, ventricular arrhythmias, and an increased risk of sudden cardiac death [4], [7], [8].

Because stress cannot be completely eliminated from modern life, stress-management strategies and anti-stress programs have become an integral part of primary and secondary prevention, treatment, and rehabilitation of coronary arterial disease [7], [8], [9]. Multidisciplinary teams including psychologists, psychiatrists, social workers, and rehabilitation specialists are increasingly involved in comprehensive cardiac rehabilitation programs [3].

Based on previously reported beneficial effects of yoga in cardiovascular patients [10], [11], [12], [13], [14], a project introducing yoga as a complementary rehabilitation method was developed. Yoga was assumed to be a valuable adjunct to conventional medical rehabilitation, particularly through reduction of psycho-emotional stress and improvement of lifestyle-related risk factors [10], [11], [12], [13].

The aim of this study was to evaluate the influence of yoga techniques on secondary prevention of coronary arterial disease during cardiovascular rehabilitation, with emphasis on reduction of chronic psycho-emotional stress and other modifiable risk factors such as smoking, diet, and obesity.

Materials and Methods

The specialized yoga courses regarding patients in the Institute were held [1], [2], [3]. The total number of courses held was 82 courses, that is 952 lessons with 976 patients. The classes were held 3 times a week in the period of 60 minutes. A group of 514 patients were regular visitors whose results are presented in this work. During the courses the patients filled in questionnaires by which we are evidencing the changes which appeared in the relation towards diseases and the relation towards yoga in the function of their rehabilitation and recovery [4], [5]. Also, they filled out the perceived stress questionnaires which give evidence of sensitivity of the patients towards stress conditions (6,7).

The selection of the patients was done by doctors-specialists who have chosen patients with easier heart attacks because of the risk of additional physical burdening [8], [9].

In the scope of integral rehabilitation of the patients a special yoga program was included. It was prepared by yoga teacher Pavlos K. Hassanagas [1], [2], [3]. The program has been connected in way to provide reducing of consequences of excessive tension, stress, anxiety and other psycho-physical problems, strengthening of the body, achieving of psycho-physical and mental relaxation and stability, achieving of consciousness about the way of living, working, relaxing, the behavior toward yourself, other people, the environment etc. [1], [2], [3], [6], [7]. At the same time, it was kind of introduction of the patients with yoga in order to continue their practice after returning home [2], [3].

The specialized yoga program includes [1], [2], [3], [6], [7]:

- **RELAXATION TECHNIQUES** which enable the body to be relaxed for relatively short time; balance the activity of nervous system and decrease the mental and physical tension. These techniques and principles of relaxative mood of practicing were the most important part of the program [6], [7];
- **VYAYAMA**: basic psycho-physical exercises for locomotion re-education, improvement of the awareness of the body and its control. The exercises activate the joints and muscles, enhance their elasticity, improve the blood circulation, strengthen the body and reduce or remove various pains, spasms and tensions in the muscles and joints. At the same time, because of their slow, relaxed and aware performance they enable dynamic relaxation i.e. and during the exercises [1], [2];
- **PRANAYAMA**: breathing techniques which enable re-education of the regular way of breathing, enhancement of the breathing capacity, better gas exchange in lungs, physical and mental calmness. The regular way of breathing positively influences all other systems of the body and their functions [6], [7];
- **KRIYAS**: cleansing techniques maintain the internal and external hygiene of the body and reduce unnecessary body consumption [6], [7].

The theoretical education part included lectures about the techniques and principles of yoga, stress, diet and negotiations about the way of living were held, the behavior towards yourself, work, environment, etc. This part of the program was intended to revive the responsibility that the patients have towards their health [1], [2], [3], [6]. Walks in nature under the control and instruction of yoga instructor were organized regularly [8], [9].

Results

The results were analyzed after one month's rehabilitation treatment where the following was taken into consideration: the clinic condition; sex and age structure; type and stage of disease; factors of risk and their correction; lasting of the disease; personnel difficulties; EKG; echocardiography opinion; KST according to standardized Bruce's method; individual evaluation of the improvements they fill after yoga practice and in relation to the disease and health condition in a whole (Table 1-6).

Table 1: Demographic structure of patients

Sex	Patients	%
Male	409	79.6
Female	105	20.4
Total	514	100.0
Age groups	**Number**	**%**
20 - 29	6	1.2
30 - 39	27	5.3
40 - 49	163	31.7
50 - 59	205	49.8
60 - 69	104	20.2
70 - 79	9	1.8
Total	514	100,0
Risk factor	**Number**	**%**
1. Arterial hypertension	146	28.4
2. Smoking	254	49.4
3. Psychic stress	321	62,5
4. Obesity	58	11.3
5. Hypercholesterolemia	51	9.9
6. Hyperglycemia (Diabetes mellitus)	51	9.9

Regarding sex structure, the male sex dominates – 79.6%: 20.4%. The largest percentage of patients are at the age of 50 up to 59 years. Multi factors of risk are obvious for the coronary arterial disease, where on the first place are: arterial hypertension with 28.4%; smoking with 49.4% and psycho stresses with 62.5% (Tab. 1).

Regarding the correction of the factors of risk, the greatest success is achieved with smoking - 89.0%, then with psycho stress - 73.8% and with arterial hypertension - 76.7% (Tab. 2).

Table 2: Correction of the risk factors

CORRECTION OF RISK FACTOR	NUMBER	%
1. Arterial hypertension	112	76.7
2. Smoking	226	89.0
3. Psychic stress	237	73.8
4. Obesity	42	72.4
5. Hypercholesterolemia	35	68.6
6. Hyperglycemia (Diabetes mellitus)	22	43.1

According to the localization of the heart attack on the myocardia, it is shown that the most common are anteroseptal and inferior infarction of myocardia (Tab. 3).

Table 3: Location of myocardial infarction

LOCATION OF MYOCARDIAL INFARCTION	NUMBER	%
1. Anterior extensive	27	5.3
2. Septal	11	2.1
3. Anteroseptal	144	28.0
4. Anterolateral	52	10.1
5. Lateral	27	5.3
6. Posterior	17	3.3
7. Inferoposterior	48	9.3
8. Inferolateral	11	2.1
9. Inferior	133	25.9
10. Subendocardial	28	5.5
11. Reinfarction	16	3.1
TOTAL	514	100.0

Table 4 shows the indexes of the pulse, pressure, and the results of Tread mill according to Bruce at the beginning and after finishing the one-month rehabilitation treatment. The doctor's opinions show improvement of integral functional cardiovascular capacities by 20%. The Tab. 4 shows evaluation of contractility shortening of the myofibrils at the beginning and after finishing the one-month rehabilitation treatment. There is an improvement of 6% for EF and 4% for FS.

Table 4: Functional evaluation of cardiovascular capacities according to the values of Treadmill coronary stress-test following the method of Bruce, and functional evaluation of contractility of the left ventricle estimated by echocardiographic measurement at the beginning and after a month of treatment

	Median score	
Treadmill coronary stress-test	**At the beginning**	**After a month**
Pulse at rest	77.1 / min	74.3 / min
Blood pressure at rest	19.2 / 11.5 kpa	15.9 / 10.8 kpa
Pulse during effort	132.5 / min	110.4 / min
Blood pressure during effort	21.8 / 12.1 kpa	21.2 / 11.0 kpa
Max. effort endured	103 Watts / min	144 Watts / min
Consumption of oxygen	1.58 L / min	2.1 L / min
Percentage of theoretically expected endurance	55%	75%
Echocardiographic measurement	**At the beginning**	**After a month**
Ejection fraction (E.F.)	53 %	59 %
Fractional shortening of the myofibrils (F.S.)	0.22	0.26

The data achieved by questioning and subjective evaluation of his/her current health condition are in correlation with the objective indexes achieved regarding the health condition of the patient after the one-month rehabilitation period.

Table 5 shows that 68.3% of the patients, because of the disease, feel reduced physical condition. 59.1% feel nervous, depressed and reduced working capability, and 25.9% besides getting tired quickly they are afraid of the disease. Cardiovascular disease in the period of rehabilitation acquires gradual and controlled introduction of the patient in the physical activity or some other engagement which acquires greater psycho-physical tension. The yoga techniques and suggested yoga methods during the courses which are a great personal engagement of each patient to resolve a part of problems that such disease bears were shown as very effective in the experience of these patients.

Table 5: Difficulties which patients have because of the disease

DIFFICULTIES	NUMBER	%
1. Reduced physical condition	351	68.31
2. Getting tired quickly and having fear of the disease	133	25.9
3. Feeling nervous, depressed with reduced working capability	304	59.1

As an improvement regarding physical plan 62.8% state improvement of their physical condition and control of getting tired. 33.5% have learned how to rest physically more effectively, and 37.5% feel bigger elasticity, which means bigger consciousness and a control of the own body. Regarding the psycho-relaxation 69.8% feel better relaxation and 19.8% feel calm and reducing of fear of the disease, which shows

acquiring of bigger safety and a capability of controlling the inner psycho conditions which these patients can be emotionally colored (Tab. 6).

The positive changes which they feel in relation to the disease are: 57.0% have an equal rhythm of the heart, 18.3% feel reduced of the pain in the chests and 14.8% have reduction of the high blood pressure. Other improvements they mention as a result of yoga techniques and which are very important for the patients are: improving of the quality of sleeping - 38.9%, reduction of the mental tension - 44.6%, better stress resistance 28.6% and improving the contact with the others - 11.3% which means increasing of self-confidence and readiness for effective joining in the normal life (Tab. 6).

Having in mind that yoga is a new activity in the scope of the rehabilitation of the patients in the Institute which is the only one in our county, we wanted to see the behavior of the patients towards yoga and how much support of the other patients, the family and the health stuff means to them in yoga practice in the Institute and after their returning home. The results achieved show that by improving contact with others there is a need for exchanging yoga experiences. 38.6% have exchanged their experience with the other patients and they have received support regarding their activity, 64.2% have exchanged their experiences with their families and they have also received support from their side and 55.4% have received full support from the health staff in the Institute. This shows that the support the patients get from the other patients, families and the health staff are very important for their engagement and successful fulfilness of yoga courses. But the fact which shows that yoga increases self-confidence at these patients and the responsibility for their own health condition and brings them to an activity and motivation in that direction, so 78.2% will go on practicing yoga after returning home, 21.0% remain undetermined, and 0.8% will not continue practicing (Tab. 6).

Table 6: Improvements which are the result of yoga exercise

Physical improvements	**Number**	**%**
1. Better physical condition	359	69.8
2. Knowing how to rest physically more effectively	172	33.5
3. Bigger elasticity	193	37.5
Subjective psychic improvements	**Number**	**%**
1. Achieving bigger calm and relaxation	359	69.8
2. Achieving bigger calm and reduction of the fear of the disease	102	19.8
Subjective improvements regarding disease	**Number**	**%**
1. Equal rhythm of the heart	293	57.04
2. Equal rhythm of the heart and reduction of the pain in the chests	94	18.3
3. Reduction of the high blood pressure	76	14.8
Other subjective improvements	**Number**	**%**
1. Better quality of sleeping	200	38.9
2. Reduction of the mental tension	229	44.7
3. Stress resistance	147	28.6
4. Improvement in contact with others	58	11.3
The importance of the support	**Number**	**%**
1. Given by other patients	200	38.9
2. Given by the family	330	64.2
3. Given by the health staff	285	55.4
Disposition for going on practicing yoga	**Number**	**%**
1. Yes	402	78.2
2. Undetermined	108	21.0
3. No	4	0.8
Total	514	100.0

Discussion

In this research all patients filled out the Perceived Stress Questionnaire which proves the increasing sensitivity of these patients towards stress and stress situations. The affirmations in questionnaire are concerning events in last two years of the patients' life, for instance what is the feeling of the patient during tension, fatigue, worry, frustration; if he/she has enough energy and enthusiasm for working; if he/she is capable to bring decisions by himself, to solve conflict situations, what is his/her attitude towards future etc.

Most of the answers give evidence that patients sometimes or very often feel fatigue, indecision, frustrations, lack of time, fear of future etc. The sense of stress and stress situations is present in the mind of patients. These stressful situations have great influence to their life and that is one of the main factors of risk for incidence and actualization of cardiovascular diseases.

It is very important that yoga not only helps the efficiency of the entire program of rehabilitation of patients but also increases the instructions and advice which doctors recommend in the function of prevention and further rehabilitation.

The rehabilitation of cardiovascular disease, especially coronary disease (already had heart attack on myocardia) is a process which provides achieving of optimal physiological, social, professional and economic capabilities of these patients. From the modern cardiovascular view, rehabilitation is a part of the integral treatment of cardiovascular patients with the aim of improving the whole quality of their health, prolonging life and improving the quality of life [4], [5]. Introducing of the specialized yoga program in rehabilitation is something new in our operation and the elaborated results, especially on psycho plan justify our expectations. We would like to point out that it is prospective study based on the previous experiences of some centres where similar research has been done, and our previous experiences in application of yoga in this field. The official doctrinal attitudes for rehabilitation of heart diseases still do not recommend yoga in the rehabilitation routine protocol [3], [4].

Our experience shows that yoga contributes for:

- reducing of the consequences of the excessive psycho-tension
- alleviating stress and increasing the resistance of the stress
- psycho-calm and relaxation of the whole body which increases the self-control
- reducing anxiety and the fear which causes activity and work
- psycho-physical and mental strengthening of the organism

- increasing of the consciousness of the way of living and working which increases the responsibility for improving the own health and life
- yoga helps in eliminating the other mentioned factors of risk which means conscious and responsible accepting of the already existing methods of rehabilitation and prevention as a part of one's living.

Specialized yoga courses meet one of the basic medical postulates: Primum non-nocere (without any consequences regarding the patient). Help in reducing and alleviating of one of the most important risk factors - psycho stresses. As a result of strengthening self-control, self-consciousness, self-confidence and self-discipline help in eliminating other risk factors (smoking, inadequate diet. obesity etc.). Yoga gives an opportunity for further independent activity after appropriate education in the Institute, because rehabilitation is lifelong process [4[, [10], [11].

Reality expected favorable effects for longer periods in the sense of secondary prevention of coronary arterial diseases. Possibility of popularization in the general population because of primary prevention and carrying out of healthy habits for life. Yoga has a favorable influence on the entire health condition of the patients of different manifestation of psycho-somatic diseases [6], [8], [9].

Possibility for initiation of multicentric studies for wider and deeper evaluation of this problem from the science view. Proper presentation of yoga science and yoga philosophy because of popularization of its application. Evaluation of our results where we can see an improvement of cardiovascular system is based on usual standardized methods of rehabilitation. This research was basically thought of as a pilot study and absence of control group, "double blind method" and other scientific epidemiologist and statistic methods showed that for a short period of time we cannot prove real organic improvements of cardiovascular system [10], [11], [12], [13], [14].

Conclusions

The effects of specialized yoga courses at 514 patients have been described in this work. The great number of these patients suffer from coronary arterial disease, that is, acute heart attack on myocardia. The yoga courses were attended in the period of one month by the patients who were staying because of rehabilitation in the Institute.

Our results show the greatest influence of yoga on eliminating and alleviating of chronic psycho stresses, increasing of self-control, self-confidence and self-discipline which provide eliminating of other risk factors, undertaking of responsibility for improving of the own health and the quality of living which provides favorable effects for a longer period in the sense of secondary prevention of the coronary arterial disease.

The results correlate with the studies published in different countries in the world (India, USA, West European countries and others).

These encouraged results must initiate further prospective controlled long lasting and multicentric studies for evaluation of favorable effects of yoga on cardiovascular system and entire health of the modern human person.

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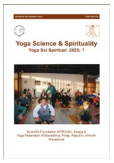

The Yoga Institute, Mumbai: Preserving Classical Yoga While Expanding Globally

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Abstract

BACKGROUND: The Yoga Institute, Mumbai, founded in 1918 by Shri Yogendra, is the world's first organized yoga center. It has played a pioneering role in making classical yoga accessible to householders while integrating scientific research, therapeutic applications, and global knowledge exchange.

AIM: To examine the historical foundations, pedagogical principles, therapeutic contributions, and international influence of The Yoga Institute, with particular attention to its role in preserving classical yoga while adapting to modern social and scientific contexts.

METHODS: A narrative historical and analytical review was conducted based on documented institutional history, published research, educational programs, archival materials, and records of international collaborations, including exchanges with the Yoga Federation of Macedonia.

RESULTS: The Yoga Institute successfully systematized classical Ashtanga and Hatha Yoga practices for householders, established early scientific research on yoga therapy, and developed structured teacher training and health programs. Its international collaborations and publications facilitated global dissemination while maintaining ethical and philosophical foundations. The Institute also influenced national yoga education standards and health policy in India.

CONCLUSIONS: The Yoga Institute represents a sustainable model for integrating classical yoga philosophy with scientific validation, therapeutic practice, and global engagement. Its century-long legacy demonstrates that yoga can remain authentic and holistic while responding effectively to modern educational, medical, and cultural demands.

Introduction

On Christmas Day 1918, at a modest residence called "The Sands" on Versova beach near Bombay, Shri Yogendra established what would become the world's first organized yoga center [1]. More than a century later, The Yoga Institute stands as a living testament to the vision of making yoga accessible to ordinary people while preserving its classical foundations [1], [2]. The Institute's history is marked not only by its pioneering role in yoga therapeutics and scientific validation but also by its commitment to international dialogue, exemplified by visits from yoga practitioners and federations from around the world [2], [3].

In 1996 The Yoga Federation of Macedonia: Pavlos K. Hassanagas, Vancho Taseski and Blagoja Gjorgieski visited The Yoga Institute, establishing cross-cultural dialogue and connection between two established yoga institutions during a pivotal period in both yoga's global expansion and North Macedonia's post-Yugoslav independence [4]. This convergence created conditions for meaningful connection between an institution rooted in Indian classical yoga tradition and established practitioners from a newly independent nation with its own developed yoga culture [4]. The visit remains a fruitful collaborative approach between the two schools (Figure 1).



Figure 1: Vancho Taseski, Pavlos K. Hassanagas, smt. Hansa Yogendra, Blagoja Gjorgieski in front of The Yoga Institute

This article examines The Yoga Institute's enduring legacy through three interconnected lenses: its historical founding and philosophical foundations, its distinctive pedagogical approach to classical yoga, and its role in facilitating international knowledge exchange [1], [2], [3].

Historical Context and Founding Vision

The Revolutionary Mission of Shri Yogendra

Manibhai Haribhai Desai, later known as Shri Yogendra (1897-1989), encountered his guru, Paramhamsa Madhavadasji, on August 26, 1916, in what he would later describe as a life-defining moment [1]. Under his guru's guidance, Yogendra developed a radical vision: to bring yoga out of forest hermitages and mountain caves, making it freely accessible to householders, men and women engaged in the daily demands of work, family, and urban life [1], [5]. This concept, revolutionary for its time, challenged the prevailing notion that serious yoga practice required renunciation of world life [5].

Paramhamsa Madhavadasji, born in 1798 to a Bengali Mukhopadhyaya family, had himself wandered extensively through Assam, Tibet, and the Himalayas, synthesizing various yogic traditions [1]. His blessing for Yogendra to establish an organized yoga center marked a significant shift in yoga's transmission model. Rather than preserving yoga knowledge as esoteric wisdom for select initiates, Yogendra would systematize and document practices, creating reproducible methodologies that could be taught widely [1]. [2].

Establishing India's First Organized Yoga Center

The Institute's founding location held symbolic significance. Dadabhai Naoroji, known as the "Grand Old Man of India" and a pioneering political leader, had connections to the residence at Versova beach. This association linked yoga's revival with India's broader independence movement and cultural renaissance [6]. The seven initial students who gathered for practice would grow into thousands, as The Yoga Institute became a model for organized yoga education worldwide [1], [2].

Yogendra's approach was methodical and scientific from the outset. Rather than presenting yoga as mystical or supernatural, he emphasized its practical applications for health, mental clarity, and emotional balance [2]. In 1920, merely two years after founding the Mumbai center, Yogendra traveled to the United States, establishing a Yoga Institute in Harriman, New York. He demonstrated advanced yogic techniques to medical professionals, including voluntary single-lung breathing and conscious control of body temperature, establishing yoga's credibility within scientific frameworks [2], [7].

The Householder Yoga Movement

Perhaps Yogendra's most enduring contribution was the articulation of "householder yoga," a complete path to yogic realization that did not require monastic renunciation. This concept, with roots in the Upanishadic period, had largely been overshadowed by centuries of emphasis on sannyasa (renunciation). Yogendra revived this ancient understanding, demonstrating that a person could maintain family responsibilities, professional obligations, and social engagement while pursuing yogic self-realization [5], [8].

His marriage to Sita Devi and their partnership in running the Institute exemplified this philosophy. The Yogendra family, three generations who have now served the Institute, embodied the principle that yoga is not an escape from life but a framework for living fully and consciously. This foundational philosophy would prove crucial in yoga's global spread, as it allowed practitioners worldwide to integrate yoga into diverse cultural and social contexts [1], [2].

Early Research and Scientific Validation

From its inception, The Yoga Institute pursued scientific validation of yogic practices. In 1924, Yogendra collaborated with Surendranath Dasgupta, a renowned orientalist and Sanskrit scholar, to conduct the first research on prana (vital energy). This pioneering work attempted to bridge yogic concepts with scientific methodology, establishing a precedent that would characterize the Institute's approach for decades [7].

In 1951, Harvard scientists Dr. Theresa Browne and UNESCO expert Dr. JB Millovanovich visited the Institute to research the effects of Yoni Mudra (a specific hand gesture and meditative practice). Such international scientific interest validated Yogendra's vision that yoga could withstand rigorous examination and contribute to global knowledge systems. The Institute equipped itself with a twelve-bed hospital and outpatient department, systematically documenting therapeutic outcomes and publishing findings that demonstrated yoga's efficacy for various health conditions [2].

Core Practices and Pedagogical Approach

Classical Ashtanga Yoga Framework

The Yoga Institute's pedagogical foundation rests firmly on Patanjali's Yoga Sutras and the eight-limbed path of Ashtanga Yoga. Unlike many modern yoga schools that focus primarily on asana (physical postures), the Institute maintains comprehensive coverage of all eight limbs: Yama (ethical restraints), Niyama (observances), Asana (posture), Pranayama (breath control), Pratyahara (sensory withdrawal), Dharana (concentration), Dhyana (meditation), and

Samadhi (absorption) [8], [10].

This classical framework positions physical practice within a larger context of ethical living and spiritual development. Students learn that asana practice serves not as an end itself but as preparation for deeper practices of breath control and meditation. The Institute's approach emphasizes that yoga is fundamentally about managing the modifications of consciousness (chitta vritti nirodha), with physical practices supporting this central aim [2], [8].

Dr. Hansaji Yogendra, current Director of the Institute, has authored over 50 books, including comprehensive commentaries on the Yoga Sutras. Her extensive teaching, over 100,000 theoretical and practical sessions, demonstrates the Institute's commitment to intellectual understanding alongside experiential practice. Students receive detailed instruction in yogic philosophy, enabling them to comprehend the "why" behind practices, not merely the "how" [2], [11].

Hatha Yoga Techniques and Modifications

While rooted in Patanjali's classical yoga, the Institute incorporates Hatha Yoga techniques from traditional texts including the Hatha Yoga Pradipika and Gheranda Samhita. However, Yogendra's significant contribution was the simplification and modification of many advanced practices, making them safe and accessible for modern practitioners with varying physical capacities [2].

The Institute developed what became known as "The Yoga Institute Techniques," specific modifications and preliminary practices that prepare students systematically for more advanced work. This approach recognizes that urban householders often lack the physical conditioning of traditional yogis who dedicated entire days to practice. By creating graduated progressions, the Institute ensured that people of all ages and physical conditions could benefit from yoga [10], [12].

Asana practice at the Institute emphasizes quality over complexity. Rather than pursuing extreme flexibility or advanced postures, students learn to perform fundamental poses with proper alignment, breath coordination, and mental attention. This approach, pioneered by Yogendra and refined over generations, prioritizes therapeutic benefit and safety over performance or display [2].

Therapeutic Yoga and Health Management

The Institute's therapeutic yoga programs represent one of its most distinctive contributions. Monthly health camps focus on specific conditions: pregnancy, diabetes, menopause, cardiology, senior citizen health, respiratory problems, stress management, orthopedics, and obesity. This systematic approach to yoga therapy predates by decades the formal establishment of yoga therapy as a professional field in the West [11].

Each therapeutic program integrates asana, pranayama, dietary guidance (sattvic nutrition), and lifestyle modifications based on yogic principles. The Institute's four-fold approach addresses Ahar (diet), Vihar (recreation), Achar (behavior), and Vichar (thought processes). This holistic framework recognizes that physical symptoms often reflect deeper imbalances in lifestyle and mental patterns [13].

Extensive research conducted at the Institute has documented yoga's efficacy for various conditions. Dr. Jayadeva Yogendra and Dr. Hansaji Yogendra led significant research on asthma, diabetes, orthopedic disorders, and heart disease, publishing findings that have influenced yoga therapy protocols worldwide. Their book "How to Reverse Heart Disease the Yogic Way" synthesizes decades of clinical experience and research outcomes [14].

In 1970, the Institute launched India's first Medical Research Unit for psychosomatic and psychiatric diseases in collaboration with the Central Council for Research in Indian Medicine and Homeopathy. This institutional recognition validated the Institute's therapeutic approach and established frameworks for systematic study of yoga's effects on mental health conditions [2].

Teacher Training Methodology

The Yoga Institute became the first Quality Council of India (QCI) certified yoga teacher training school in India, setting standards for comprehensive yoga education. The Institute's teacher training emphasizes not merely technical skill in performing or teaching asanas but deep understanding of yoga philosophy, anatomy, physiology, and the ethical responsibilities of teaching [15].

The curriculum includes extensive practical experience. Trainees participate in health camps, work with diverse populations, and learn to adapt practices for individual needs. This experiential component ensures that graduates can address the complex health challenges and lifestyle constraints of modern students. Over 50,000 yoga teachers trained at the Institute have carried out these principles worldwide [2].

The Institute assisted the University of Mumbai and the National Council of Educational Research and Training (NCERT) in drafting yoga syllabi for academic programs. In 1989, Dr. Jayadeva and Hansaji Yogendra spearheaded the vital project of formulating yoga education syllabus for schools nationwide. This work influenced how millions of Indian students encounter yoga, ensuring that classical principles inform educational approaches [15].

Teacher training at the Institute emphasizes the concept of the "Life School," yoga education aimed

not at commercial success or physical fitness alone but at cultivating wisdom for living well. This philosophical grounding distinguishes Institute-trained teachers, who understand their role as facilitators of comprehensive personal development rather than mere fitness instructors [16].

Research, Documentation, and Archival Work

The Institute has produced over 500 published works, documenting practices, philosophy, and research findings. The monthly journal "Yoga & Total Health," published continuously since the Institute's founding, represents one of the longest-running yoga publications globally. These materials preserve detailed descriptions of techniques, case studies of therapeutic applications, and philosophical reflections that might otherwise have remained within oral traditions [2], [4].

In December 2008, the Institute launched India's first yoga museum, displaying yoga's 5,000-year heritage through paintings, literature, copies of ancient letters, and historical equipment. This museum serves both educational and preservational functions, ensuring that future generations can access authentic representations of yoga's development [2], [4].

In recent years, the Institute partnered with Google Arts & Culture to digitize and provide online access to 400 archival images and artifacts. This initiative exemplifies the Institute's dual commitment to preserving tradition and embracing technology for wider dissemination. Researchers and practitioners worldwide can now access rare historical materials that illuminate yoga's modern evolution [2], [4].

Yoga Federation of Macedonia

Historical Context of Yoga in North Macedonia

The 1996 visit by the Yoga Federation of Macedonia occurred during a period of significant transition for both yoga globally and for North Macedonia as a newly independent nation. Following North Macedonia's peaceful secession from Yugoslavia in 1991, the country had already established its yoga community and practices, with the Yoga Federation of Macedonia serving as the first recognized institution for yoga education and practice.

During the Yugoslav period, yoga developed in the region through the teacher Pavlos K. Hassanagas. The establishment of the Yoga Federation of Macedonia represented the formalization of a yoga culture in the country. The organization aligned itself with multiple international bodies including the International Association of Yoga Science Centers, World Federation of Holistic Health Sciences, and International Yoga Federation, reflecting its commitment to international dialogue and connection within the global yoga community [4].

The Cultural Exchange Framework: Typical Patterns

Based on documented patterns of international visits to The Yoga Institute during the 1990s, a visit such as the one by the Yoga Federation of Macedonia would typically have represented a connection between two established yoga institutions, a meeting aimed at fostering dialogue and mutual understanding between different approaches to yoga practice and education.

Pavlos K. Hassanagas, Vancho Taseski and Blagoja Gjorgieski during this period held a conference and generally participated in the Institute's daily practices, asana and pranayama sessions, philosophical discussions, and health camps, while also contributing their own perspectives and experiences from their respective yoga traditions (Figure 2).



Figure 2: Vancho Taseski, Pavlos K. Hassanagas, smt. Sitadevi Yogendra and Harold Sequeira

For international visitors in general during this period, encountering The Yoga Institute offered opportunities for dialogue and comparison. They could observe yoga practiced in its Indian cultural context, share perspectives on how different traditions approach yogic philosophy and practice, and explore commonalities and differences in therapeutic applications of yoga across cultures.

Documentation and Lasting Impacts

These connections between established yoga institutions helped create channels for ongoing communication and mutual support. The relationship between the Yoga Federation of Macedonia and The Yoga Institute likely represented one example of how yoga communities in different parts of the world could maintain meaningful dialogue while each preserving their own distinct approaches and traditions.

Such exchanges typically contributed to participating institutions' understanding of yoga's diverse expressions globally (Figure 3).

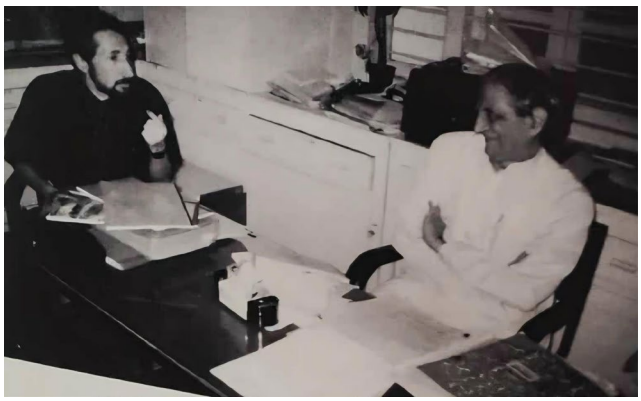

Figure 3: Discussion between Pavlos K. Hassanagas and Jayadeva Yogendra

By encountering practitioners from different cultural backgrounds with their own developed practices and perspectives, institutions gained broader appreciation for how yoga adapts to and enriches various cultural contexts while maintaining its essential principles.

Global Influence and Continuing Legacy

International Network and Affiliated Centers

From its early years, The Yoga Institute cultivated international connections. Yogendra's 1920 trip to America established the pattern of traveling to teach and create institutional links. Over subsequent decades, thousands of international students have studied at the Institute, many establishing their own teaching centers upon return to their home countries. This organic network creation contrasts with franchised yoga brands, representing instead a community of practitioners united by shared training and philosophical commitments.

The Institute's influence extends through its publications, which have been translated into multiple languages. Books authored by Yogendra family members provide accessible introductions to yoga philosophy and practice, reaching readers who cannot travel to Mumbai. These publications maintain the Institute's voice in global yoga discourse, offering perspectives rooted in classical tradition but articulated for contemporary readers [17].

Dr. Hansaji Yogendra's prominence as "First Lady of Yoga" has amplified the Institute's international visibility. Her participation in major events, including sharing the stage with Prime Minister Narendra Modi on International Yoga Day in 2015, signals governmental recognition of the Institute's contributions. This visibility attracts international practitioners seeking authentic yoga education [17].

The Institute's adoption of technology, online classes, YouTube presence, and digital archives, has extended its reach beyond those who can physically visit Mumbai. Virtual students worldwide can access teachings, though the Institute maintains that direct residential study provides deeper immersion. This balance between technological innovation and commitment to traditional guru-student relationships characterizes the Institute's contemporary approach.

Contributions to Yoga Science and Research

The Institute's century-long commitment to research has generated substantial contributions to yoga science. Early studies on prana, breath control, and physiological effects of asana established methodologies are still relevant today. More recent research on yoga therapy for specific conditions has influenced clinical applications of yoga in medical settings worldwide.

The Institute's approach to research emphasizes yogic epistemology, understanding that yoga operates according to its own principles, which cannot be entirely reduced to conventional scientific frameworks. While valuing scientific validation, the Institute maintains that yoga's true effects extend beyond measurable physiological changes to encompass psychological and spiritual dimensions requiring different assessment methods.

By training researchers and publishing findings, the Institute has influenced how yoga research is conducted globally. The emphasis on comprehensive, holistic assessment rather than narrow outcome measures reflects the Institute's philosophical understanding that yoga affects the whole person. This perspective has enriched yoga research by encouraging broader, more nuanced study designs.

The Institute's collaboration with government bodies, recognition by the Ministry of AYUSH, partnerships with NCERT, Quality Council of India certification, demonstrates how traditional institutions can contribute to national health and education policy. The Prime Minister's Award in 2018 acknowledged the Institute's "outstanding contribution in the field of Yoga," validating a century of work [18].

Educational Impact and Standardization

Through its teacher training programs and curriculum development work, The Yoga Institute has shaped yoga education standards in India and internationally. The QCI certification established benchmarks for teacher training quality, influencing how other institutions structure their programs. The emphasis on comprehensive study including philosophy, anatomy, teaching methodology, and ethics has become standard in serious teacher training.

The Institute's work with NCERT on school yoga curricula has impacted millions of students. By ensuring that children encounter yoga in educational contexts with appropriate philosophical grounding and

safety considerations, these curricula shape how future generations understand and practice yoga. This educational influence may prove more lasting than any single school or style of yoga practice [19].

The Institute's philanthropic programs, free sessions for BMC schools, camps for juvenile homes and women's shelters, training for Mumbai Police, demonstrate commitment to yoga's accessibility regardless of economic status. By serving marginalized populations, the Institute embodies Yogendra's original vision of yoga for all, not merely for affluent practitioners seeking wellness services [20].

Preservation of Classical Yoga in a Commercialized Landscape

In an era of rapid yoga commercialization, branded yoga styles, and Instagram-influenced practice, The Yoga Institute serves as custodian of classical approaches increasingly marginalized in global yoga culture. The Institute's insistence on philosophical study, ethical foundations, and practice motivated by self-knowledge rather than external achievement offers alternative to market-driven yoga.

This preservational role involves tensions. The Institute must remain financially sustainable without commercializing excessively; must maintain standards without becoming elitist; must preserve tradition while adapting to contemporary contexts. The Institute's navigation of these tensions, through modest fees, residential study programs, and emphasis on service, provides a model for traditional institutions facing modernization pressures.

The Institute's concept of yoga as a "Life School" counters trends toward yoga as mere physical fitness. By maintaining that yoga education aims at cultivating wisdom for living well, the Institute resists reduction of yoga to gymnastics or stress relief. This philosophical stance, communicated through decades of teaching and publication, influences practitioners worldwide who seek yoga's deeper dimensions [21].

Contemporary Challenges and Future Directions

The Yoga Institute faces challenges common to traditional institutions in rapidly changing cultural landscapes. How to maintain authenticity while remaining relevant? How to use technology while preserving the importance of direct transmission? How to serve growing numbers without compromising quality? How to influence global yoga development while respecting diverse expressions?

The Institute's responses include careful adoption of online platforms that extend reach without replacing residential study; continued investment in research that demonstrates yoga's efficacy in scientific terms; partnerships with educational and governmental bodies that influence policy; and training of teachers who carry forward classical approaches in diverse contexts.

Future challenges include intergenerational transmission of knowledge, as living links to Yogendra's era diminish. The Institute addresses this through extensive documentation, but also through emphasis on direct experience, the experiential knowledge that cannot be fully captured in texts. Maintaining this balance between preservation and living tradition remains crucial [22].

The Institute must also navigate yoga's increasing secularization globally. While respecting diverse motivations for yoga practice, the Institute maintains that yoga's deepest benefits emerge from understanding its spiritual foundations. This creates tension with purely therapeutic or fitness-oriented approaches, requiring careful articulation of how classical yoga encompasses but transcends health applications [23].

Conclusions

The Yoga Institute's century-long journey from a small gathering on Versova beach to a globally recognized center of yoga education exemplifies the successful navigation of tradition and modernity. Shri Yogendra's revolutionary vision, making yoga accessible to householders through systematic education and scientific validation while maintaining authentic classical foundations, continues to guide the Institution through its third generation of family leadership.

The 1996 visit by the Yoga Federation of Macedonia, situated within broader patterns of international connection, illustrates how established yoga institutions facilitate global dialogue. These meetings typically benefit both parties through exposure to different perspectives and methods, fostering mutual appreciation and ongoing connection.

The Institute's dual commitment, preserving Patanjali's classical Ashtanga Yoga while pioneering therapeutic applications, research methodologies, and educational innovations, offers valuable models for yoga's future development. In an increasingly commercialized yoga landscape, institutions that maintain philosophical depth, ethical grounding, and commitment to service provide essential counterweights to market-driven trends.

As yoga continues to evolve globally, the question of authentic transmission becomes more complex. The Yoga Institute's emphasis on comprehensive education, ethical practice, and yoga as a way of life rather than mere physical exercise positions it as guardian of essential principles often lost in yoga's popularization. The Institute demonstrates that tradition need not be rigid or exclusionary but can adapt to serve diverse populations while maintaining core commitments.

The Yoga Institute's story ultimately concerns the possibilities and challenges of preserving living traditions amid rapid social change. Neither completely traditional nor entirely modern, neither exclusively Indian nor fully global, the Institute characterizes yoga's contemporary existence. By honoring its founder's vision while responding to new contexts, the Institute continues its mission: making yoga's transformative potential accessible to all who seek genuine knowledge of this ancient science of living.

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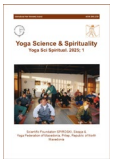

Yoga Mīmāṃsā: Journal of Science and Culture in Yoga (YMJSCY) – A Review of the First Scientific Yoga Journal

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Abstract

BACKGROUND: Scientific journals play a central role in validating and disseminating research through peer review. For much of history, yoga was viewed primarily as a spiritual discipline, with limited scientific investigation. The establishment of Yoga Mīmāṃsā: Journal of Science and Culture in Yoga (YMJSCY) in 1924 marked a turning point by introducing systematic scientific inquiry into yogic practices.

AIM: To review the historical origins, scientific scope, editorial development, and continuing significance of Yoga Mīmāṃsā as the world's oldest peer-reviewed multidisciplinary journal dedicated to yoga research.

METHODS: A qualitative, literature-based historical and descriptive review was conducted using peer-reviewed publications, archival materials, editorial records, and institutional documentation related to YMJSCY and the development of scientific yoga research.

RESULTS: Founded by Swami Kuvalayananda at the Kaivalyadhama Institute, YMJSCY emerged from early experimental studies conducted in 1920–1921 that integrated traditional yogic philosophy with modern scientific methods. The journal has maintained uninterrupted publication for over a century, reaching 57 volumes by 2025. Its content spans fundamental, applied, interdisciplinary, and philosophico-literary research, supported by a rigorous double-blind peer-review process and open-access dissemination.

CONCLUSIONS: Yoga Mīmāṃsā has played a foundational role in establishing yoga as a subject of systematic scientific inquiry. Its longevity, adaptability, and scholarly influence underscore its enduring relevance in both historical and contemporary yoga research.

Introduction

Scientific journals publish peer-reviewed articles to ensure that research meets established standards of quality and scientific validity, playing a key role in sharing reliable scientific knowledge. Basic research in yoga focuses on studying the fundamental principles, mechanisms, and effects of yoga practice on the body, mind, and consciousness using scientific methods, such as clinical trials, physiological measurements, and psychological analyses [1], [2]. Such publications examine yoga through the lens of modern research, bridging traditional practice with contemporary scientific inquiry.

In the early 19th century, yoga was largely regarded as a purely spiritual practice, and its scientific aspects had rarely been explored [2]. The oldest peer-reviewed multi-disciplinary research journal on yoga is *Yoga Mīmāṃsā: Journal of Science and Culture in Yoga* (YMJSCY), a semiannual publication founded in 1924 by Swami Kuvalayananda at the Kaivalyadhama Institute in Lonavala, Western India [3], [4], [5]. The Kaivalyadhama Institute itself adheres to the undiluted principles of yoga as described in the Yoga Sutras of Maharishi Patanjali. Today, it remains one of the oldest and foremost scientific yoga research institutes in the world [6].

We aimed to review the historical origins, scientific scope, editorial development, and continuing significance of Yoga Mīmāṃsā as the world's oldest peer-reviewed multidisciplinary journal dedicated to yoga research.

Methods

This study employs a qualitative, literature-based historical and descriptive review of peer-reviewed publications, archival records, and institutional documentation related to Yoga Mīmāṃsā and the development of scientific yoga research [3], [4], [5], [6], [7]. Primary sources include published journal issues, editorial records, and secondary scholarly literature addressing the historical evolution, editorial

practices, and scientific scope of yoga research journals [1], [2].

Results

Swami Kuvalayananda (1883–1966), born Jagannatha Ganesa Gune, was a pioneering figure in "scientific yoga," blending traditional yogic philosophy with modern scientific approaches. Fully aware of the vast yogic potentialities and their effects on the human body and mind, he initiated systematic investigations into selected yogic practices during 1920–1921, conducting experiments with a group of students in the laboratory of Baroda Hospital [4], [7]. His subjective experiences, combined with the positive outcomes of these early scientific studies, convinced him that the ancient system of yoga, when examined through a modern experimental approach, could significantly contribute to both the spiritual and material advancement of human society. This conviction became his life's mission and laid the foundation for institutionalized scientific yoga research [5], [6].

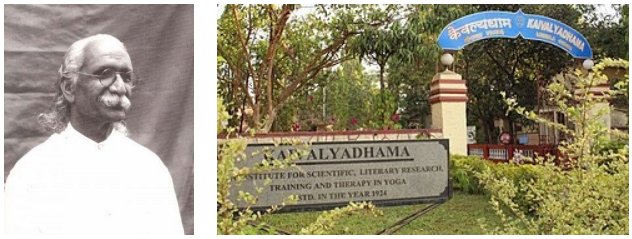

Figure 1: Swami Kuvalayananda (Jagannatha Ganesa Gune, 1883–1966), founder of scientific yoga and initiator of systematic experimental research on yogic practices at the Baroda Hospital Laboratory during 1920–1921, which laid the foundation for institutionalized yoga research and the establishment of Yoga Mīmāṃsā journal [4], [7]

His students, including S. P. Nimbalkar, went on to become influential yoga teachers. After Kuvalayananda's death, leadership and scholarship at Kaivalyadhama continued under scholars such as Dr. O. P. Tiwari [6]. The current editorial team comprises Dr. Ranjeet Singh Bhogal as Editor-in-Chief, Ms. Anita Verma as Editor, and Mr. Sanjay Shete as Associate Editor, all from the Scientific Research Department at Kaivalyadhama [8].



Figure 2: Dr. Ranjeet Singh Bhogal, Editor-in-Chief of Yoga Mīmāṃsā journal, representing the continuity of editorial leadership at Kaivalyadhama Institute. [6], [8]

The inaugural issue of *Yoga Mīmāṃsā*, published in October 1924, included nine articles. Swami Kuvalayananda sought to make his research accessible and beneficial to the general public, having published scientific findings since 1917 [3], [5]. He aimed to make yoga accessible to all while promoting its health and spiritual benefits. His work simultaneously sought to scientifically study the highest states of human experience, investigate spiritual phenomena, and use systematic experimentation on individual experiences to reinforce the objective character of Indian philosophy [1], [2].

As of 2025, Yoga Mīmāṃsā has published 57 volumes, with the latest being Volume 57, Issue 1 (January–June 2025), demonstrating its continuous publication and ongoing relevance. The 2024 Impact Factor of the journal is 0.474 [8], [9], [10].



Figure 3: Chronological development and publication continuity of Yoga Mīmāṃsā: Journal of Science and Culture in Yoga from its inaugural issue in 1924 to Volume 57, Issue 1 (January–June 2025), demonstrating sustained relevance and uninterrupted contribution to scientific yoga research [3], [8], [9].

The journal's scientific section covers fundamental and applied research on physiological, psychological, and biochemical aspects of yogic practices, including preventive health care, holistic well-being, and complementary medicine [1], [3]. It also emphasizes interdisciplinary studies linking yoga with fields such as neuroscience, biomechanics, quantum physics, radiology, and management [1], [2]. The philosophico-literary section focuses on theoretical foundations of yoga embedded in ancient Sanskrit texts, unpublished yogic manuscripts, and research integrating classical yogic concepts with modern scientific knowledge [2], [6].

YMJSCY follows a rigorous editorial and double-blind peer-review process to ensure the quality, originality, and relevance of published research [8]. Manuscripts are initially screened by editors and, if suitable, sent to expert reviewers. Authors may revise their manuscripts based on reviewer feedback. Accepted papers undergo copy-editing and formatting before final approval by the corresponding author. The journal is available in print and online as an open-

access publication, allowing free access to full-text articles and permitting authors to self-archive final accepted versions in OAI-compliant repositories. It is included in the UGC-CARE Group I list, indexed in public directories such as DOAJ, and published in English by Wolters Kluwer Medknow Publications, with long-term digital preservation through partnerships with Portico and CLOCKSS [8], [9]. Although not indexed in the Scopus database, YMJSCY has established itself as a pioneering platform in the scientific study of yoga.

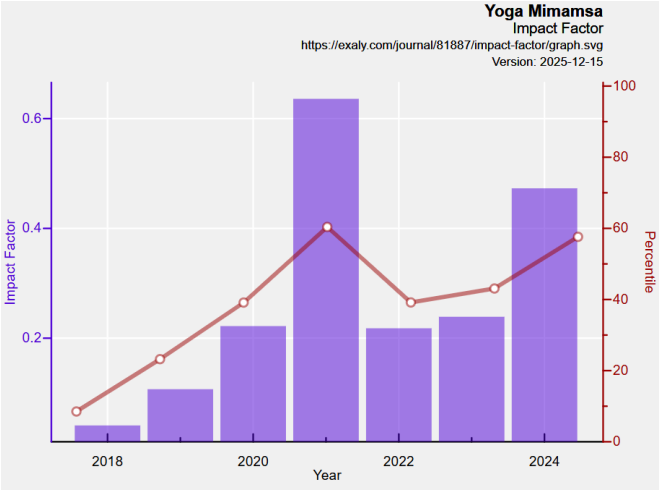

Figure 4: Impact Factor and Percentile ranking of Yoga Mīmāṃsā journal from 2017 to 2024. The blue bars represent Impact Factor values, while the red line indicates Percentile position of the journal in its category [10]

Discussion

Following the pioneering efforts of *Yoga Mīmāṃsā*, other journals emerged, such as the International Journal of Yoga Therapy (IJYT), established in the 1990s by the International Association of Yoga Therapists (IAYT). IJYT became a leading journal focusing on yoga therapy and both clinical and scientific research, contributing significantly to the development of yoga therapy as a recognized scientific discipline [11].

Despite numerous challenges over the years, *Yoga Mīmāṃsā* has survived for a century, reflecting remarkable resilience and ongoing relevance. The journal continues to evolve, digitize, modernize, and integrate new scientific approaches while honoring its classical yogic foundation [3], [4].

We must mention that only one specialized journal—International Journal of Yoga Therapy—is indexed in Scopus. International Journal of Yoga Therapy (ISSN: 1531-2054, eISSN: 2168-5835, published by International Association of Yoga Therapists, United States) is the only journal devoted to yoga and indexed in Scopus database. The journal was included in Scopus from 2011-2013 and from 2016-2025. This is Q2 journal with CiteScore 2024 of 1.7, SJR 2024 of 0.357, SNIP 2024 of 0.384, and Hirsh Index 2024 of 21 [12]. Despite its relatively modest output, its Q2 ranking and stable scientometric indicators indicate sustained recognition of yoga therapy as a legitimate clinical field [13]

Conclusion

This review highlights the foundational role of *Yoga Mīmāṃsā* in establishing yoga as a subject of systematic scientific inquiry. Through the pioneering efforts of Swami Kuvalayananda, the journal successfully bridged traditional yogic philosophy with modern scientific methodology, setting standards for future research in the field. Its continued publication, high-impact articles, and adaptability demonstrate the enduring relevance of scientific yoga research in both historical and contemporary contexts.

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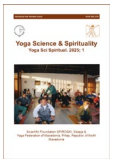

Interview with Dr Vasilije Tomanoski from Nefroplus, Ohrid, Republic of North Macedonia

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Abstract

BACKGROUND: Chronic kidney disease (CKD) is a progressive condition associated with severe physical, psychological, and social consequences, particularly in patients requiring long-term hemodialysis. Alongside conventional nephrological care, there is growing interest in complementary rehabilitation approaches aimed at improving quality of life.

AIM: To present the historical development of the Dialysis Center in Struga, outline the clinical challenges of CKD and hemodialysis, and evaluate the role and effects of yoga as a complementary method in the rehabilitation of patients with chronic kidney insufficiency by the interview with Dr Vasilije Tomanovski from the Nefroplus, Ohrid, Republic of North Macedonia.

METHODS: This work is based on a descriptive and experiential analysis of clinical practice at the Dialysis Center in Struga, combined with observations from a seven-month pilot yoga therapy program involving patients with end-stage CKD undergoing hemodialysis. Data were derived from clinical experience, patient-reported outcomes, and professional observations, and were further discussed in scientific and international forums.

RESULTS: Hemodialysis significantly prolonged survival and improved metabolic stability but was associated with physical, neurological, and psychological complications. The yoga therapy program was well accepted by both patients and medical staff and led to improvements in dialysis tolerance, physical endurance, mood, sleep quality, social interaction, and adherence to dietary and hygiene regimens. In some patients, profound psychosocial and functional improvements were observed.

CONCLUSIONS: The Dialysis Center in Struga emerged as a leading institution in the former Yugoslavia due to strong professional dedication and team spirit. CKD patients face complex physical and psychological burdens that are only partially addressed by hemodialysis. The integration of yoga as a complementary rehabilitation method was well accepted by both patients and medical staff and was associated with notable improvements in physical endurance, psychological well-being, social interaction, and tolerance to dialysis. These findings support the holistic integration of complementary therapies into conventional care and justify further controlled and long-term research on yoga therapy in CKD rehabilitation.

1. Dr Tomanoski, the Dialysis Center in Struga (Figure 1) was one of the first in the territory of the former Yugoslavia for treatment and rehabilitation of chronic kidney insufficiency as well as other kidney issues. You were among the first generation of doctors who established and worked in this center. Can you tell us more about this period, the enthusiasm, and the challenges that the young team of doctors faced?



Figure 1: Vasilije Tomanoski, MD, PhD, Nefroplus, Ohrid, North Macedonia

Thanks to the founder and visionary Dr Stojan Kovačeski, who made an enormous contribution to the development of healthcare and nephrology in Struga and Macedonia, the first hemodialysis in Struga was performed on September 4, 1978, at the internal medicine department of the Medical Center. On April 7, 1984, the Center for Dialysis, Nephrology and Rehabilitation began operating as a separate, newly constructed hospital, modernly equipped, which represented the only hospital for the needs of the thousands of patients in dialysis centers in the former Yugoslavia.

The interest in the Struga dialysis center from patients from all republics of the former Yugoslavia was so great that the medical staff had to work in four shifts until the early morning hours. This was successfully accomplished, primarily due to the dedication of the professional team, which were highly motivated and human. The doctors and nurses strived to ensure that patients felt not only their professional care but also

friendly warmth and closeness, so that together with the patients they went on excursions to Radožda or Sveti Naum, which provided patients with many joyful moments and restored optimism to their lives.

I started working in 1982, immediately after graduation, and as a young doctor I was part of the team of the first generation of dialysis doctors. Younger doctors like me had much to learn from our older colleagues, and regular education was conducted at professional meetings held on Sundays as the only day off when we could all participate. I believe that thanks to the enthusiasm, motivation, team spirit and unity of the professional team, all challenges were more easily overcome, which contributed to rapid development and success in our work and enabled the Dialysis Center to achieve the reputation of one of the leading healthcare institutions in the former Yugoslavia (Figure 2).



Figure 2: Medical team before the opening of Dialysis Center in Struga, Republic of North Macedonia

2. What is the nature of the disease and what physical and psychological health problems do patients with chronic kidney insufficiency face?

Chronic kidney disease (CKD) signifies partial or complete reduction of the kidney function for longer than 3 months due to various causes, among which the most common are hypertension and diabetes. Patients with CKD often face physical complications due to reduced kidney function, which leads to the accumulation of toxins and disturbances in the balance of fluids and minerals. Psychological problems usually arise from these physical changes, the stress caused by the disease, and chronic fatigue.

Symptoms worsen with the progression of CKD. The most common physical problems are chronic fatigue, weakness, and swelling of the legs, hands, and ankles due to fluid retention, followed by frequent urination, nausea, loss of appetite, anemia, pale skin, bone pain, high blood pressure, and muscle cramps, while in advanced stages there is difficulty breathing, weight loss, constant itching, and sleep problems. The most common psychological and neurological problems are fatigue, apathy, drowsiness, and reduced concentration due to toxin accumulation. Disorientation, confusion, aggression, hallucinations, focus issues, as well as anxiety, depression, and mood disturbances are commonly associated with the chronic nature of the disease.

3. Due to the nature of the disease, in some patients the kidneys are dysfunctional. But in a large number of patients, they do not function at all. In such cases, these patients are prescribed the process of hemodialysis. Tell us more about the hemodialysis process, what are its benefits and effects as well as the difficulties and challenges that patients face during this process.

Hemodialysis is a method for cleansing the blood of waste products and excess fluid in patients with end-stage renal insufficiency, performed 3 times per week for 4-5 hours. It offers significant benefits, but also carries risks and challenges that require careful management. The kidney does not only filter blood and excrete waste materials, but is an endocrine organ in which hormones and enzymes are secreted. Such is erythropoietin which stimulates the production of red blood cells in the bone marrow especially during hypoxia, producing active vitamin D, important for calcium absorption and bone health. It also secretes renin which initiates the renin-angiotensin-aldosterone system for regulating blood pressure and salt balance.

Hemodialysis improves overall health by controlling blood pressure and balancing minerals such as potassium and sodium. Patients often feel more energy, better appetite, and reduced swelling and shortness of breath. Additionally, independent hemodialysis in home settings offers greater flexibility in terms of duration and schedule, and enables patients to continue with regular work. Common difficulties and complications in hemodialysis patients include fatigue after sessions, nausea, dizziness, and muscle cramps during treatment, as well as neurological complications such as uremic encephalopathy, dialysis disequilibrium syndrome, dementia, and peripheral neuropathy. Long-term, patients risk infections of the vascular access, thromboses, heart problems, anemia, renal hypertension, renal osteodystrophy due to disrupted metabolism of vitamin D, calcium, and phosphorus.

4. What is the ultimate sustainable solution for chronic kidney insufficiency?

The ultimate sustainable solution for chronic kidney insufficiency (CKI), especially in advanced stages, is kidney transplantation from a living donor or cadaver, enabling complete restoration of kidney function in successful cases. Dialysis (hemodialysis or peritoneal dialysis) removes toxins and excess fluid and serves as a life-saving replacement before transplantation, but is not a completely sustainable solution due to the need for regular sessions and complications. Conservative measures such as diet, medications such as erythropoietin for correction of anemia, bicarbonate for acidosis slow the progression,

but do not permanently cure the condition. For prevention and slowing the progression of CKI, regular control of diabetes and hypertension as the most common causes of CKI is necessary, with determination of creatinine in the blood and proteinuria, a low-protein diet, and limited intake of salt and potassium.

5. After several contacts and meetings with the hospital's management team, a collaboration between the Yoga Society Struga and the Institute for Dialysis from Struga was established with the initiative of applying yoga as a complementary part of the integral rehabilitation of patients. This collaboration resulted in the organization of a specialized course in yoga therapy for patients. How was this initiative received by the medical team but also by the patients for whom this project was actually intended?

The specialized course in yoga therapy for patients with end-stage CKD was held at the Institute for Nephrology, Dialysis and Rehabilitation in Struga. It lasted seven months and a total of 62 hours were held, three times a week for sixty minutes. The course was attended by a total of 24 patients, of whom 19 were men and 5 were women. The group was inconsistent due to the different dialysis centers the patients would be transferred, travel, shorter stays at the Institute in Struga, which is why the course was fully attended by 5 patients. In addition to the patients, a physiotherapist, doctor, and other support staff participated in the course. The course was well received among the patients, the professional team at the Institute gave full support, and some patients and doctors showed special interest in the course. The results and conclusions of this research were drawn based on their work and the results achieved.

6. What were the changes and improvements on a physical and psychological level in patients as a result of regular yoga practice as a complementary part of rehabilitation at the Institute?

In some patients, specific improvements were noted such as obtaining a healthy body weight, better sleep, reduction of headaches, improved mood, improved elasticity, and stable blood pressure. Among the common improvements registered were better tolerance of dialysis, better tolerance of diet, increased calmness, improved contacts with other people, reduction of muscle cramps and joint pain, increased disciplined attitude toward the hygiene-dietary regimen, increased physical endurance and activity.

In some patients there were drastic positive changes that were surprising for them as well as for the staff.

For example, one young patient did not always accept dialysis, was most often uncommunicative, depressed, and in phases of more serious crises when he would even pull the needles out of the fistula during the dialysis itself. But he was persistent and regularly came to yoga classes. Gradually over time, visible positive changes began to happen: he started to smile more, to participate in conversations after each class, and to socialize with other patients. He would go to town sometimes on foot, sometimes by bicycle to buy groceries for himself, but also for other patients. During the summer period on the beaches, he even began to socialize with girls and boys from the town who were approximately his age.

Another middle-aged patient who was accommodated on the top floor said that he often found it difficult to move on the stairs, both going down and going up. But after the classes, not only was he climbing the stairs, but he climbed with faster steps as if jogging. The patients and staff who saw this were surprised and amazed and asked him how is that possible, and that it must be the yoga classes.

7. These results were summarized in a pilot study on the effects of yogic practice in patients with renal insufficiency. The topic was presented at the World Congress on Yoga and Holistic Medicine in France and at the First Scientific Conference in Ohrid. According to our knowledge at that time, we did not come across anywhere in our country or in the world where yoga had been used as a complementary method of rehabilitation for chronic kidney insufficiency in a health institution. What was the response and reactions of experts in the field of yoga, medicine, Ayurveda, and holistic medicine at these scientific conferences?

Our study on the effects of yogic practice in hemodialysis patients was unique at the Congress, which is why it generated special interest among participants who asked numerous questions. The discussion emphasized that yoga and meditation can improve the quality of life in patients with CKD by having a positive effect on general, physical, and psychological health, and on improving social relationships.

8. At the congress in France, you had the opportunity to meet, exchange opinions and experiences with doctors of Ayurveda, traditional Indian medicine, yoga therapists... What is your experience and position regarding the relationship between traditional Eastern medicine and modern Western medicine?

While Western medicine has a materialistic approach concerning the human body in which the emphasis is placed on the treatment of physical and physiological changes in the body and its organs, traditional Eastern medicine devotes greater attention to the internal functions of the organs and bases its idealistic conception on life energy. Western medicine applies a narrowly specialized method of treatment in which the diagnosis of the disease is the main guide that directs the forms and methods of treatment, while the traditional Eastern system of healing is essentially holistic - viewing the human body as a whole, as an

inseparable part of the Universe that functions according to its laws. Therefore, in traditional Eastern medicine, the type of imbalance is determined, not the diagnosis of the disease.

Eastern medicine treats human health as the ability of the human body to maintain balance and integrity. Man is part of the microcosm surrounded by the Universe in which the same forces operate on which the microcosm is based. Man is part of the whole. Just as the organs of the body communicate with each other, so does man communicate with nature. Western medicine does not take into account the spiritual world, while for Eastern medicine the spirit is in balance with the body, the sick body is identified with a sick spirit. What distinguishes traditional Eastern medicine from Western medicine is herbal medicine and the application of modern dietary preparations based on the principles of traditional Eastern medicine, widely accepted almost throughout the entire world. It can help those who have become ill, but also those who want to maintain vitality and health.

We discussed more broadly the differences and points of contact between Western and Eastern philosophical approaches and religions with some of the Congress participants. From my own experience, I have felt eternity on one occasion, being torn away from time and I mentioned that even people who do not belong to any religion can have a mystical experience, described as "cosmic consciousness" or "oceanic feeling". Various opinions were expressed in the conversation, but what is common to all the great world religions is that mystics give similar descriptions of the mystical experience, but the difference between them is noticeable when one needs to give a religious or philosophical interpretation.

In Western mysticism, that is, in Christianity, Judaism, and Islam, mystics describe the mystical experience as an encounter with God. In these religions, although God is everywhere in nature and in the man’s soul, at the same time God is elevated far above the world. In Eastern mysticism, that is, in Hinduism, Buddhism, and Chinese religion, mystics describe the mystical experience as total union with God or with the "soul of the world," but emphasize that such a mystical experience does not come by itself and that they must pass through the "path of purification and enlightenment" to meet God. That path consists of a simple life and various meditation techniques.

9. In your opinion, should research on yoga therapy as a complementary part of rehabilitation for this type of disease be continued, improved, and elevated to a higher level?

Existing studies on the application of yoga as a complementary method of rehabilitation in patients with CKD presented in several international journals, especially from India, confirm the positive effects of yoga and meditation on improving the quality of life and the hygiene-dietary nutrition regimen in patients with CKD. To confirm the existing results, future studies need to include a control group of patients, and to examine specific aspects and gain a deeper understanding of the experiences and perceptions of CKD patients regarding yoga and meditation, it is necessary to conduct long-term studies designed in detail according to the needs of patients with CKD.

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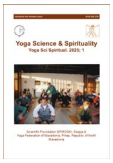

Calendar of Events in Scientific Yoga, Spirituality, and Related Disciplines, 2026 (Ayurveda, Homeopathy, Naturopathy, etc.)

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January 12-14, 2026

International Conference on Ayurveda and Yoga 2026
Mahayogi Guru Gorakhnath AYUS University *Gorakhpur, Uttar Pradesh, India*

Scientific research in yoga and Ayurveda, integration into healthcare systems; traditional and modern approaches.

January 24, 2026

Scientific Conference on Yoga & AI

Athens, Greece

Hellenic Yoga Association

Experience in the era of artificial intelligence.

The Conference is organized with support and cooperation of the Municipality of Athens.

February 6, 2026

World Conference on Medicine, Yoga and Mental Health (WCMYMH)

Dubai, UAE

A premier interdisciplinary platform for researchers and practitioners to discuss recent innovations and research in medicine, yoga and mental health.

March 21, 2026

Evidence on Yoga: Future for Health & Care 2026

Linköping University, Sweden

Scientific results on the effects of yoga on medical conditions, integration into the healthcare system.

March 2026

International Conference on Integrative Medicine & Yoga

São Paulo, Brazil

Yoga in clinical practice, research on mental health and cardiovascular effects.

April 2026

International Conference on Integrative Medicine & Yoga

Sydney, Australia

Yoga in clinical practice; research on mental health and cardiovascular effects.

May 8-10, 2026

Global Integrative Medicine Congress (GIMC 2026) ***Memphis, Tennessee, USA***

Clinical applications of yoga, diagnostics and rehabilitation. Ayurveda integration, including naturopathy, neurophysiological and musculoskeletal effects.

June 6-8, 2026

Hamilton Island Medical Conference ***Hamilton Island, Queensland, Australia***

Medical education, integrative medicine; yoga and

mind-body practices as part of clinical approaches.

June 11-13, 2026

SYTAR 2026 - Symposium on Yoga Therapy and Research

Hilton Orange County, Costa Mesa, California, USA

Latest research in yoga therapy. Symposium on yoga research (SYR); clinical applications and therapeutic models.

June 2026

Latin American Congress on Yoga Therapy & Research

Buenos Aires, Argentina

Yoga therapy, psychophysiology; rehabilitation yoga and sports medicine.