

Yoga as a Holistic and Evidence-Based Approach to Stress Management and the Promotion of Mental Well-being: A Systematic Review

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Abstract:

Background: Stress has become one of the most prevalent public health concerns worldwide, affecting individuals across all age groups and professions. Persistent stress contributes to numerous physical and psychological disorders, including anxiety, depression, hypertension, cardiovascular diseases, impaired immunity, and reduced quality of life. As conventional pharmacological interventions are often associated with adverse effects and limited long-term sustainability, complementary and integrative therapies such as yoga have gained increasing recognition as effective strategies for stress reduction and mental well-being.

Materials and Methods: A systematic review of published literature was conducted following Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. Electronic databases including PubMed, Scopus, Web of Science, Google Scholar, Cochrane Library, and Science Direct were searched for studies published between January 2015 and March 2026. Randomized controlled trials, systematic reviews, meta-analyses, and observational studies evaluating yoga interventions for stress reduction and mental health outcomes were included. Data extraction, quality assessment, and narrative synthesis were performed.

Results: Thirty-two eligible studies involving adults, adolescents, healthcare professionals, students, elderly populations, and patients with chronic illnesses demonstrated that yoga significantly reduced perceived stress, anxiety, depressive symptoms, and psychological distress while improving emotional regulation, resilience, mindfulness, sleep quality, cognitive functioning, and overall quality of life. Most studies also reported improvements in physiological stress markers such as cortisol levels, heart rate variability, blood pressure, and inflammatory biomarkers.

Conclusion: Current evidence supports yoga as a safe, cost-effective, and evidence-based holistic intervention for managing stress and enhancing mental well-being. Integrating yoga into healthcare systems, educational institutions, workplaces, and community wellness programs may substantially improve psychological health and quality of life. Further multicenter randomized controlled trials using standardized yoga protocols are recommended to strengthen the evidence base.

Keywords: Yoga; Stress Management; Mental Health; Mental Well-being; Mindfulness; Anxiety; Depression; Complementary Therapy; Quality of Life; Systematic Review.

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INTRODUCTION

Stress has emerged as one of the leading contributors to the global burden of disease, affecting individuals irrespective of age, occupation, socioeconomic status, or geographical location.¹ Chronic exposure to psychological stress is associated with dysregulation of the hypothalamic-pituitary-adrenal (HPA) axis, excessive cortisol secretion, impaired autonomic nervous system balance, chronic inflammation, immune dysfunction, cardiovascular diseases, metabolic disorders, anxiety disorders, depression, burnout syndrome, and diminished quality of life.²⁻⁴ According to the World Health Organization, mental health disorders represent one of the leading causes of disability worldwide, with depression and anxiety contributing significantly to years lived with disability and reduced workplace productivity.⁵

Rapid urbanization, technological advancements, changing lifestyles, academic pressure, occupational stress, financial insecurity, family conflicts, social isolation, and global crises have substantially increased stress levels across populations.⁶ The COVID-19 pandemic further intensified psychological distress globally by increasing uncertainty, fear, loneliness, grief, and economic instability, highlighting the urgent need for effective, affordable, and accessible interventions to support mental health.⁷ Consequently, healthcare professionals and policymakers have increasingly recognized the importance of integrating preventive and holistic approaches into mental healthcare.

Conventional approaches to stress management primarily involve pharmacological treatments such as anxiolytics and antidepressants, along with psychotherapy, particularly cognitive behavioral therapy (CBT).⁸ Although these interventions are effective for many individuals, long-term pharmacotherapy may be associated with adverse effects including dependence, withdrawal symptoms, sedation, cognitive impairment, gastrointestinal disturbances, and reduced adherence.⁹ Additionally, psychological therapies often require trained professionals, repeated clinical visits, financial resources, and sustained patient motivation, limiting accessibility in low-resource settings.¹⁰ These limitations have stimulated growing interest in complementary and integrative health practices that emphasize self-care, prevention, and holistic well-being.

Yoga, an ancient discipline originating in India more than 5,000 years ago, has evolved into one of the most widely practiced mind-body interventions worldwide.¹¹ The term "Yoga" is derived from the Sanskrit root *Yuj*, meaning "to unite" or "to join," reflecting the integration of body, mind, and spirit. Classical yoga encompasses multiple interconnected practices including physical postures (asanas), breathing exercises (pranayama), meditation (dhyana), relaxation techniques, mindfulness, ethical principles, and lifestyle modifications.¹² Unlike interventions targeting isolated symptoms, yoga seeks to promote overall physical, psychological, emotional, social, and spiritual health.

Over the past two decades, yoga has transitioned from being viewed primarily as a traditional wellness practice to becoming an evidence-based complementary therapy supported by growing scientific research.¹³ Numerous randomized controlled trials have demonstrated that regular yoga practice significantly reduces perceived stress, anxiety, depressive symptoms, emotional exhaustion, and burnout while improving resilience, emotional regulation, self-awareness, mindfulness, sleep quality, cognitive performance, and overall psychological well-being.¹⁴⁻¹⁷ These findings have encouraged healthcare organizations worldwide to incorporate yoga into preventive medicine, rehabilitation, chronic disease management, workplace wellness initiatives, and mental health promotion programs.

The physiological mechanisms underlying yoga's beneficial effects involve complex interactions

between neuroendocrine, autonomic, immune, and psychological pathways. Regular yoga practice has been shown to reduce activation of the sympathetic nervous system while enhancing parasympathetic activity through vagal stimulation.¹⁸ This autonomic rebalancing decreases heart rate, lowers blood pressure, improves heart rate variability, and enhances cardiovascular function. Simultaneously, yoga reduces circulating cortisol levels and modulates the HPA axis, thereby reducing physiological responses to chronic stress.¹⁹ Neuroimaging studies have also demonstrated increased activation of brain regions involved in emotional regulation, attention, executive functioning, and self-awareness following consistent yoga and meditation practice.²⁰

In addition to neurophysiological effects, yoga exerts significant immunomodulatory and anti-inflammatory actions. Chronic stress promotes systemic inflammation through elevated concentrations of inflammatory cytokines such as interleukin-6 (IL-6), tumor necrosis factor-alpha (TNF- α), and C-reactive protein (CRP).²¹ Several clinical studies have reported that yoga interventions significantly decrease inflammatory biomarkers while improving antioxidant capacity and immune regulation, thereby contributing to both physical and psychological resilience.²² These findings suggest that yoga addresses not only psychological symptoms but also the underlying biological mechanisms associated with chronic stress.

Yoga has demonstrated effectiveness across diverse population groups. Among students, yoga improves concentration, academic performance, emotional stability, examination-related stress, and sleep quality.²³ Healthcare professionals practicing yoga experience lower burnout, reduced compassion fatigue, improved resilience, and enhanced occupational well-being.²⁴ Older adults benefit from improved balance, cognitive functioning, emotional well-being, and reduced loneliness.²⁵ Patients with chronic illnesses—including cancer, cardiovascular disease, diabetes mellitus, chronic pain, arthritis, and neurological disorders—have also shown improvements in stress levels, treatment-related symptoms, fatigue, and quality of life following structured yoga programs.²⁶

Furthermore, yoga has become increasingly relevant in occupational health. High workplace stress contributes to absenteeism, reduced productivity, employee turnover, and increased healthcare expenditures. Workplace yoga interventions have consistently demonstrated reductions in occupational stress, musculoskeletal discomfort, anxiety, and fatigue while enhancing job satisfaction, work engagement, and psychological resilience.²⁷ Similar benefits have been reported among teachers, military personnel, police officers, and corporate employees exposed to prolonged occupational stress.

Mental well-being extends beyond the absence of psychiatric illness and encompasses positive emotional functioning, psychological resilience, life satisfaction, purpose, interpersonal relationships, and adaptive coping abilities.²⁸ Yoga promotes these positive dimensions by fostering mindfulness, self-compassion, emotional awareness, acceptance, and present-moment attention. Regular practitioners often report enhanced self-esteem, optimism, emotional intelligence, and social connectedness, all of which contribute to sustained mental well-being.²⁹

Despite the growing body of evidence, variability exists among published studies regarding yoga styles, intervention duration, session frequency, participant characteristics, outcome measures, and methodological quality. Such heterogeneity makes it challenging for clinicians, educators, researchers, and policymakers to draw comprehensive conclusions regarding yoga's effectiveness across different populations and settings. Therefore, a systematic synthesis of current evidence is essential to evaluate the consistency of findings, identify knowledge gaps, and guide evidence-based implementation of yoga interventions.

The present systematic review aims to critically evaluate contemporary evidence regarding the effectiveness of yoga as a holistic intervention for stress management and the promotion of mental well-being. Specifically, this review seeks to examine the impact of yoga on psychological outcomes, physiological stress markers, quality of life, emotional resilience, and overall mental

health across diverse populations. By synthesizing findings from recent randomized controlled trials, systematic reviews, and observational studies, this review provides evidence to inform clinical practice, public health initiatives, nursing care, educational programs, and future research in integrative mental health.

MATERIALS AND METHODS

Study Design

This systematic review was conducted in accordance with the **Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020)** guidelines to ensure transparency, reproducibility, and methodological rigor.¹ The review aimed to comprehensively evaluate the effectiveness of yoga as a holistic intervention for stress management and the promotion of mental well-being across diverse populations.

Research Question

The review was guided by the following research question:

"What is the current evidence regarding the effectiveness of yoga in reducing stress and improving mental well-being among healthy individuals and patients with physical or psychological conditions?"

The research question was formulated using the **PICOS framework**²:

Component	Description
Population (P)	Adults, adolescents, elderly individuals, students, healthcare professionals, employees, and patients with chronic diseases or mental health conditions
Intervention (I)	Yoga interventions including asanas, pranayama, meditation, mindfulness, relaxation techniques, or integrated yoga programs
Comparison (C)	Standard care, no intervention, wait-list control, physical exercise, psychotherapy, or other complementary therapies
Outcomes (O)	Stress reduction, anxiety, depression, psychological well-being, resilience, quality of life, sleep quality, cortisol levels, heart rate variability, and other physiological or psychological outcomes
Study Design (S)	Randomized controlled trials (RCTs), quasi-experimental studies, cohort studies, systematic reviews, and meta-analyses

Information Sources

A comprehensive literature search was performed using the following electronic databases:

- PubMed/MEDLINE
- Scopus
- Web of Science
- Google Scholar
- ScienceDirect
- Cochrane Library

Additional studies were identified through manual searches of the reference lists of eligible articles to minimize publication bias.

The search included articles published from **January 2015 to March 2026**.

Search Strategy

A structured search strategy was developed using Medical Subject Headings (MeSH) terms and Boolean operators ("AND" and "OR"). The primary search terms included:

("Yoga" OR "Mind-Body Therapy" OR "Meditation" OR "Pranayama")

AND

("Stress Management" OR "Psychological Stress")

AND

("Mental Health" OR "Mental Well-being" OR "Anxiety" OR "Depression")

AND

("Quality of Life")

The search strategy was modified according to the indexing requirements of each database to maximize retrieval of relevant studies.³

Eligibility Criteria

Studies were selected according to predefined inclusion and exclusion criteria.

Inclusion Criteria

Studies were included if they met the following criteria:

- Published in English.
- Published between January 2015 and March 2026.
- Human participants.
- Evaluated yoga as the primary intervention.
- Reported at least one stress-related or mental health outcome.
- Randomized controlled trials.
- Controlled clinical trials.
- Cohort studies.
- Cross-sectional studies.
- Systematic reviews.
- Meta-analyses.
- Full-text articles available.

Exclusion Criteria

Studies were excluded if they:

- Were conference abstracts only.
- Included animal experiments.
- Were editorials or opinion articles.
- Were narrative reviews without systematic methodology.
- Did not specifically evaluate yoga.
- Did not report stress or mental health outcomes.

- Were duplicate publications.
- Had insufficient methodological information.

Study Selection

All retrieved articles were imported into a reference management software, and duplicate records were removed.

The study selection process consisted of four sequential stages:

1. Identification of studies through database searching.
2. Removal of duplicate records.
3. Title and abstract screening.
4. Full-text eligibility assessment.

Two independent reviewers screened all studies. Any disagreement regarding study eligibility was resolved through discussion and consensus. Where necessary, consultation with a third reviewer was undertaken to ensure accuracy and reduce selection bias.⁴

Data Extraction

A standardized data extraction form was developed before data collection.

The following information was extracted from each eligible study:

- First author
- Year of publication
- Country
- Study design
- Sample size
- Population characteristics
- Type of yoga intervention
- Duration of intervention
- Frequency of sessions
- Comparator group
- Outcome measures
- Main findings
- Study limitations

Data extraction was independently completed by two reviewers to minimize extraction errors.

Quality Assessment

The methodological quality of included studies was assessed using internationally accepted critical appraisal tools according to study design.

- **Randomized Controlled Trials:** Cochrane Risk of Bias Tool (RoB 2).⁵
- **Observational Studies:** Newcastle–Ottawa Scale (NOS).⁶
- **Systematic Reviews:** AMSTAR-2 Checklist.⁷

Each study was evaluated for:

- Selection bias

- Performance bias
- Detection bias
- Attrition bias
- Reporting bias
- Overall methodological quality Studies were categorized as having **low**, **moderate**, or **high** risk of bias.

Outcome Measures

The primary outcomes included:

- Perceived stress
- Psychological stress
- Anxiety
- Depression
- Mental well-being

Secondary outcomes included:

- Sleep quality
- Emotional resilience
- Mindfulness
- Burnout
- Cognitive functioning
- Quality of life
- Heart rate variability
- Blood pressure
- Salivary cortisol
- Serum cortisol
- Inflammatory biomarkers
- Heart rate
- Emotional regulation

Data Synthesis

Due to heterogeneity in study populations, intervention protocols, duration of yoga practice, outcome measures, and assessment tools, a **narrative synthesis** was performed rather than a quantitative meta-analysis.

Studies were grouped according to:

- Population
- Type of yoga intervention
- Mental health outcomes
- Physiological outcomes
- Study quality The overall strength of evidence was evaluated by considering consistency of findings, methodological quality, sample size, and risk of bias.

Reporting of Results

The study selection process was summarized using the **PRISMA 2020 flow diagram**, including:

- Records identified
- Records screened
- Full-text articles assessed
- Studies included in the final review The characteristics of included studies were summarized in descriptive tables, and findings were synthesized narratively according to intervention type and outcome measures.

Ethical Considerations

As this study was a systematic review based exclusively on previously published literature, **ethical approval and informed consent were not required**. The review adhered to the principles of research integrity, transparency, and accurate reporting of evidence.

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