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Can yoga be the answer? The positive aspects of practicing yoga across various medical conditions - a mini review

Weronika Rostkowska, Natalia Gajdzińska, Adam Salwa, Wojciech Rutkowski, Maciej Rzepka, Karolina Sztuba, Justyna Puchała, Katarzyna Rymaszewska, Dominika Starzomska, Karolina Basiura

Natalia Gajdzińska
ORCID 0009-0009-1072-2895
https://orcid.org/0009-0009-1072-2895;
gajdzinska.natalia@gmail.com
Independent Public Health Care Institute of the Ministry of Internal Affairs and Administration in Katowice,
ul. Wita Stwosza 41, 40-514 Katowice, Poland
Weronika Rostkowska
ORCID 0009-0009-3759-9989
https://orcid.org/0009-0009-3759-9989;
weronika.rostkowska97@gmail.com
Narutowicz City Speciality Hospital at Krakow, ul Prądnicka 35-37; 31-202 Kraków

Wojciech Rutkowski
ORCID 0009-0004-7393-4231
https://orcid.org/0009-0004-7393-4231;
worutkowski@gmail.com
Leszek Giec Upper-Silesian Medical Centre of the Silesian Medical University in Katowice
ul. Ziołowa 45 / 47, 40-635 Katowice

Adam Salwa
ORCID 0009-0009-2534-7872
https://orcid.org/0009-0009-2534-7872;
asalwa97@gmail.com
Independent Public Health Care Institute of the Ministry of Internal Affairs and Administration in Katowice,
ul. Wita Stwosza 41, 40-514 Katowice, Poland

Maciej Rzepka
ORCID 0009-0009-9005-817X
https://orcid.org/0009-0009-9005-817X
macrze0@gmail.com
ST. BARBARA SPECIALIZED REGIONAL HOSPITAL No.5, Medyków Square 1, 41-200 Sosnowiec, POLAND

Karolina Sztuba
ORCID 0000-0003-4987-3833
https://orcid.org/0000-0003-4987-3833
k.sztuba96@gmail.com
SPZOZ District Railway Hospital in Katowice

Justyna Puchała
ORCID 0009-0002-6155-6670
https://orcid.org/0009-0002-6155-6670
Independent Public Health Care Institute of the Ministry of Internal Affairs and Administration in Katowice, ul. Wita Stwosza 41, 40-514 Katowice

Katarzyna Rymaszewska
ORCID 0009-0006-1848-1991
https://orcid.org/0009-0006-1848-1991
Independent Public Health Care Institute of the Ministry of Internal Affairs and Administration in Katowice, ul. Wita Stwosza 41, 40-514 Katowice

Dominika Starzomska
ORCID 0009-0006-1607-2502
https://orcid.org/0009-0006-1607-2502
Independent Public Health Care Institute of the Ministry of Internal Affairs and Administration in Katowice, ul. Wita Stwosza 41, 40-514 Katowice

Karolina Basiura
ORCID 00009-0002-2680-4114
https://orcid.org/0009-0002-2680-4114
2-nd Speciality Hospital in Bytom, ul. Stefana Batorego 15, 41-902 Bytom, Poland

Corresponding author:
Natalia Gajdzińska
ORCID 0009-0009-1072-2895
https://orcid.org/0009-0009-1072-2895;
gajdzinska.natalia@gmail.com
Independent Public Health Care Institute of the Ministry of Internal Affairs and Administration in Katowice, ul. Wita Stwosza 41, 40-514 Katowice, Poland

Summary

Yoga, an ancient practice encompassing both body and mind, has gained global popularity as a method supporting physical and mental health. Originating in India thousands of years ago, yoga has evolved to meet contemporary needs, integrating postures- asanas, breathing elements- pranayamas and spiritual/mental-meditation. Today, it is practiced by millions of

people worldwide in various styles, such as Vinyasa Yoga, Ashtanga Yoga, Hatha Yoga, Yin Yoga, and Iyengar Yoga, each of which can be tailored to individual goals and preferences. Yoga offers extensive health benefits across diverse conditions, including cardiovascular health, respiratory function, mental well-being, and prenatal care. Its holistic approach, supported by research, underscores its potential as a valuable adjunct therapy for improving overall health and quality of life.

Keywords: Yoga; Mental health; Depression; Anxiety; Sleep quality; Pregnancy.

Abstract

Introduction: Yoga is well-regarded for its diverse health benefits, potentially impacting psychiatric, asthma, cardiovascular, autoimmune, and neurological conditions. It is also associated with broader positive effects such as improving quality of life, fitness levels, and psychosocial outcomes for individuals. Hatha yoga, widely practiced and studied worldwide, emphasizes physical postures (asana) and breathing exercises (pranayama), both of which contribute positively to overall mental and physical health.

Aim of the study: The aim of this study is to review the benefits of practicing yoga based on the latest scientific research. Both physical benefits, such as improved flexibility, strength, and balance, and psychological benefits, including stress reduction, anxiety relief, and enhanced overall well-being, will be analyzed. This paper aims to demonstrate how regular yoga practice can contribute to an improved quality of life and support the treatment of various health conditions. The mechanisms through which yoga impacts health will also be discussed, and the effectiveness of yoga will be compared with other forms of physical activity and relaxation techniques.

Material and methods: We have gathered the available materials and scientific reports, analyzing and summarizing them in a single study.

Conclusions: Yoga's diverse health benefits, supported by extensive research, highlight its potential as a valuable therapy for improving overall health and well-being across various medical conditions.

Inflammatory markers and gene expressions.

Recent studies have increasingly focused on examining how yoga affects inflammatory markers and hormones such as IL-1β, IL-6, TNF-α, INF-γ, CRP, and cortisol. Encouraging findings highlight substantial reductions in IL-1β and IL-6 levels [29], particularly beneficial for autoimmune conditions like rheumatoid arthritis [12] and diabetes. IL-6 also exerts significant influence on diseases such as cancer, obesity, and cardiovascular disorders. The observed decline in CRP levels is pivotal, given its wide use as a systemic inflammation marker across conditions ranging from chronic obstructive pulmonary disease to depression and cancer. Standardizing IL-1β, IL-6, and CRP as markers in future yoga studies could streamline comparative analyses across research endeavors. [13,14]. Emerging research underscores yoga's potential to modulate gene expression and epigenetic mechanisms across various health conditions. Furthermore, yoga practice appears to enhance innate antiviral responses and and brain health through the enhancement of natural defense genes and increased expression of microRNA-29c. Additionally, yoga shows promise in stimulating telomerase activity, improving DNA repair mechanisms, and enhancing ocular health and cellular longevity. Nevertheless, substantial research hurdles persist, such as the diversity of aspects influenced by yoga and the predominant emphasis on short-term outcomes in current research. Overcoming these obstacles requires standardized protocols, robust study methodologies, and extended follow-up periods to substantiate and understand the enduring impact of yoga-induced epigenetic changes. [3]

Yoga benefits in chronic conditions.

Mental health.

Depression is the primary contributor to the global burden of mental health-related diseases and a leading cause of disability worldwide. It affects about 280 million people and accounted for more than 47 million disability-adjusted life-years in 2019. [1,2] Moreover, depression is associated with early mortality from other illnesses and suicide. [2] Yoga as an adjunct therapy shows positive effects for various types of depression mainly due to its influence on the parasympathetic system, which results in relaxation and reduced stress levels [3]. This is evident in cases of perinatal depression, where yoga practice has been effective in alleviating symptoms of depression and anxiety. [4,5] Similarly, in major depression, the benefits of practicing yoga can reduce the severity of depression [6] and accumulate over time. [7]

Studies have demonstrated a reduction in symptoms following a single 60-minute session per week, although the optimal duration and frequency of yoga practice remain unclear due to insufficient evidence. Preliminary research indicates no significant difference in alleviating depression symptoms between practicing yoga once or twice a week. However, more frequent sessions are associated with a reduction in anxiety symptoms. [5,8].

Sleep quality.

Sleep is unquestionably one of the most crucial physiological functions; its deficiency can lead to various adverse effects including disruptions in concentration and memory, reduced alertness, decision-making challenges, impaired cognitive function [9], and increased body weight. [10] Sleep helps regulate cortisol levels and total sleep deprivation can elevate cortisol slightly. Moreover, there is a well-established link between stress and sleep. Stress-induced arousal can lead to insomnia, disrupting sleep. Stress correlates with sleep deficits, shorter duration, and higher morning cortisol levels. [22]

Yoga is recognized as a safe and effective method for reducing the severity of fatigue and depressive moods, while also improving sleep quality. Engaging in yoga necessitates mindfulness and concentration, promotes elevated melatonin levels and decreases hyperarousal which can impact sleep quality. [11] A recent study examining the effects of yoga on anxiety concluded that yoga could be a safe and effective intervention for individuals experiencing high anxiety levels. The reduction of anxiety symptoms observed in most participants confirms yoga's effectiveness in stress reduction, which may directly impact insomnia. Additionally, increased melatonin levels from yoga practice can further improve insomnia. [22,23]

Cardiovascular diseases.

Cardiovascular disease (CVD) and metabolic syndrome are significant public health issues globally. [30] Metabolic syndrome is characterized by the presence of at least three metabolic risk factors: elevated blood pressure, high blood sugar levels, excess body fat, and abnormal cholesterol levels, which substantially heighten the risk of future cardiovascular complications. [31] Recently published systematic reviews suggest that yoga may have beneficial effects on cardiovascular disease risk factors and both the primary and secondary prevention of CVD and metabolic syndrome. [30] Significant improvements have been observed in the yoga practice group, including reductions in diastolic blood pressure (DBP), triglycerides (TG), and increases in HDL levels. Additionally, there were positive changes in

systolic blood pressure (SBP), heart rate, respiratory rate, waist circumference, waist/hip ratio, total cholesterol (TC), HDL, very low-density lipoprotein, HbA1c, and insulin resistance. [30]

Asthma.

Asthma as defined by Global Initiative for Asthma (GINA 2022) as a "common, chronic respiratory disease characterized by variable symptoms of wheeze, shortness of breath, chest tightness and/or cough, and by variable expiratory airflow limitation". [27] Alongside conventional pharmacological treatment, incorporating yoga practice into therapy should be considered. Studies have shown significant improvements in cardiorespiratory functions in patients with bronchial asthma, including better pulse rate, systolic blood pressure, and respiratory function measurements. Additionally, there was a reduction in the frequency and severity of asthma attacks, a decreased need for medication, and an overall enhancement in quality of life. [28]

Muscular dystrophies.

Muscular dystrophies are a group of genetic muscle disorders that cause progressive muscle weakening and degeneration. Among these, Duchenne muscular dystrophy (DMD) is the most common and one of the most severe. DMD is an X-linked disease that affects approximately 1 in 3500 to 1 in 5000 boys. It is caused by a mutation in the dystrophin gene. [15] Yoga practice as a complement to pharmacotherapy gives promising results in the treatment of muscular dystrophy, improving respiratory functions and heart rate variability, helping to increase flexibility, but also improving strength and muscle tone in patients.

Yoga practice may exert beneficial effects in muscle diseases through various mechanisms, including lowering catecholamine and angiotensin II levels, and enhancing nitric oxide availability, thereby reducing blood pressure and improving muscle blood flow. [16,17]

Epilepsy.

Yoga is thought to help stabilize the electroencephalogram and the autonomic nervous system, potentially aiding in seizure control for people with epilepsy (PWE). [24] Higher levels of relaxation can positively impact seizures and help to control them. Yoga can influence limbic system activity, which in turn affects the hypothalamus, potentially modulating the sympathetic nervous system and regulating endocrine secretions. Conditioning these areas through regular meditation practice may help maintain normal homeostasis. Reducing stress, a key benefit of meditation, may significantly contribute to reducing seizures and altering

EEG patterns. [26] Consequently, individuals may choose yoga as one of the tools to manage their chronic conditions, potentially empowering them to adapt to their condition and achieve optimal well-being. [25]

Yoga in pregnancy.

The historical origins of yoga as a prenatal practice are not well-documented, making it unclear exactly when yoga began to be specifically adapted for pregnant women. Traditional yoga has been practiced for thousands of years, but its prenatal adaptations likely emerged more recently as part of modern prenatal care developments. [18] Research increasingly shows the positive effects of practicing yoga during pregnancy. Firstly, slow, intentional, and deep breathing primarily engages the parasympathetic nervous system by stretching lung tissue and stimulating the vagal nerves. This leads to physiological changes such as a reduction in heart rate, blood pressure, metabolic rate, and oxygen consumption. [18,19] Natural physiological changes during pregnancy, including increases in cardiac output, heart rate, and plasma volume, can be balanced through intentional parasympathetic activation achieved during yoga. Studies indicate that healthy pregnant women who practice yoga exhibit enhanced autonomic responses to stress throughout their pregnancy. Breathing in slow, rhythmic breaths can also reduce stress and symptoms of anxiety and depression induced by pregnancy. [20] Secondly, practicing yoga during pregnancy can significantly alleviate the commonly reported and troublesome symptom of chronic lower back pain. According to current scientific reports, practicing yoga (especially Hatha Yoga) for one hour a week over a 10-week period, focusing on stretching and strengthening the back and abdominal muscles, significantly improves quality of life and reduces pain. [18,28] Finally, in a recent preliminary study involving high-risk pregnancies, consistent with earlier findings, the yoga group exhibited fewer cases of pregnancy-induced hypertension (PIH), gestational diabetes mellitus (GDM), preeclampsia, intrauterine growth restriction (IUGR), and preterm deliveries. [21]

Conclusion.

Yoga emerges as a versatile and beneficial practice with significant implications for both physical and mental health across various conditions. Scientific research supports its efficacy in improving cardiovascular health, respiratory function, and quality of life. Yoga's impact extends to managing chronic diseases such as asthma, muscular dystrophy, and epilepsy, potentially enhancing physiological functions and reducing symptoms. Moreover, its

application in mental health, particularly in alleviating depression, anxiety, and improving sleep quality, underscores its holistic benefits. Additionally, yoga's adaptation for prenatal care shows promises in enhancing maternal well-being and mitigating pregnancy-related complications. As research continues to explore its mechanisms and benefits, integrating yoga into healthcare strategies could offer valuable adjunctive therapies for optimizing overall health and well-being.

Authors contribiution:

Conceptualization: Natalia Gajdzińska, Weronika Rostkowska

Methodology: Weronika Rostkowska, Adam Salwa

Software: Wojciech Rutkowski, Justyna Puchała

Check: Natalia Gajdzińska, Weronika Rostkowska

Formal Analysis: Wojciech Rutkowski, Karolina Sztuba

Investigation: Adam Salwa, Justyna Puchała

Resources: Karolina Sztuba, Dominika Starzomska, Karolina Basiura

Data curation: Wojciech Rutkowski, Maciej Rzepka

Writing- rough preparation: Natalia Gajdzińska, Weronika Rostkowska, Katarzyna Rymaszewska

Writing- review and editing: Wojciech Rutkowski, Karolina Sztuba

Visualization: Adam Salwa, Maciej Rzepka, Karolina Basiura

Supervision: Dominika Starzomska, Justyna Puchała, Katarzyna Rymaszewska

Project administration: Natalia Gajdzińska, Weronika Rostkowska

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