

## A COMPARATIVE REVIEW ON IMPACT OF YOGA AND PHYSICAL EXERCISE ON HEALTH

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Article Received on 12/07/2022

Article Revised on 02/08/2022

Article Accepted on 22/08/2022

### ABSTRACT

Yoga is a comprehensive spiritual instrument that has many advantages, including bettering health and wellbeing. Asanas (physical postures), pranayama (controlled breathing), and meditation are yoga practises that are frequently used for their health benefits. Yoga may be mistakenly thought of as another form of physical exercise because, when viewed in the context of asanas, it mimics physical exercise more closely. In terms of principles, potential mechanisms, and efficacy for health benefits, this article explores the similarities and contrasts between yoga and physical activity. A narrative review is conducted using both classic and modern yoga literature, as well as scientific articles on yoga and exercise that are currently available. There are many similarities between physical activities and the physical aspects of yoga practises, but there are also significant variances. Yoga therapies appear to be comparable to and/or superior to exercise in most outcome measures, according to the evidence. Yoga techniques differ from physical workouts in a number of ways, including an emphasis on maintaining postures, controlling breath, and practising with mindfulness.

**KEYWORDS:** Yoga, Exercise, Anxiety, Heart diseases, Mind.

### INTRODUCTION

As yoga becomes more and more popular among people from all walks of life, it is also contrasted with other movement-based disciplines, particularly physical workouts. One may mistakenly think of yoga as an exercise because of how similar the external movements appear to be. In this article, yoga and physical exercise are compared and contrasted from a range of physiological, psychological, and spiritual viewpoints.

There are many similarities between physical activities and the physical aspects of yoga practises, but there are also significant variances. According to evidence, yoga therapies are comparable to or even outperform exercise in almost all outcomes. Yoga activities are distinguished from physical workouts by their emphasis on breathing control, mindfulness during practise, and the preservation of postures. They also affect the body and the brain differently, both in healthy subjects and in people with a variety of physical and mental illnesses. Additionally, yoga has several benefits for improving mental health in the healthy population and for treating a

variety of physical and neuropsychiatric illnesses as a solo or supplementary therapy. Yoga may not only be an appropriate supplement to treatment but also a legitimate, respectable, and successful substitute for physical activity. Yoga has benefits similar to exercise in that it is affordable, non-invasive, has a low risk of negative effects or drug interactions, does not need medical supervision for practise, and has the extra advantage of enhancing physical fitness.<sup>[1]</sup> These features may boost patient preference and compliance and may entice patients who are hesitant or intolerant of using medication. Low-intensity exercise, like yoga, appears to have positive impacts on the body and mind. Research has to be done to elucidate the biological processes underlying each effect.

### ORIGIN AND PURPOSE

#### Yoga

Yoga's core definition—controlling mental changes and connecting with the universal—suggests that it places a high value on mental and spiritual health in addition to bodily health. Although yoga has been practised since the pre-vedic era, it wasn't until the Sage Patanjali

solidified its theory and practical conceptions, drawing mostly on samkhya and vedic philosophy, that it acquired an organised format. Although asanas (physical postures) were practised during Patanjali's time, they were not given much importance because the emphasis was mainly on meditation. As a result, several postures helpful for practising meditation alone were incorporated into their spiritual practises. This is very clear because the Patanjali yoga sutras as a whole do not contain even a single named asana. Since it is somewhat simpler to concentrate on motions than it is solely focusing directly on the mind, sages who followed Patanjali attempted to change the practises of yoga by including additional physical components. The goal of "managing the mental alterations" with physical postures acting as one of the scaffolding remained the same despite the addition of extra physical elements under the guise of asanas. This is obvious from how the asanas are performed, which is different from other physical exercises—slowly with synchronised breathing and careful awareness of the motions. The eight limbs of Patanjali yoga represent a hierarchical (albeit not necessarily sequential) structure of systematic development of awareness, from the coarse to the subtle levels. Yama, Niyama: Level of behaviour Posture and Breathing: Physical Level Mental level: Pratyahara, Dharana Samadhi and Dhyana - Spiritual level In contrast to exercise, the objective behind yoga is to achieve calm rather than just physical wellness.<sup>[2]</sup>

### Exercise

Exercise is defined by the Oxford English Dictionary as "a physical activity done to maintain or enhance health and fitness." Even though humans may not have known what exercise was at the time, if we take exercise to be any type of physical activity, then exercise has existed since the beginning of the species. Hunting, shamanic dancing, and constructing a home were all forms of exercise that still exist today. However, the profession of exercise, comprising sports, athletics, and gymnastics, did not emerge until the 18th century. Before exercise became a profession, it was primarily employed to train warriors; as entertainment in the form of competition in sports or gymnastics at public events; and by a select few, such as Confucius, Hippocrates, and Galen, as a curative or preventative strategy. As a result, from a historical perspective, exercise and related activities were primarily a form of recreation in older civilizations and only recently began to be recognised as a form of therapy (preventive/curative).<sup>[3][4]</sup>

### YOGA CLASSIFICATION

Fundamentally speaking, yoga falls into one of two categories: Patanjali Ashtanga yoga, to start focused on movement-based contemplative techniques like asana and pranayama as well as direct contemplative techniques like meditation. Hatha yoga,<sup>[2]</sup> ii Before beginning other aspects of yoga, such as the Yama, Niyama, asana, etc., includes kriyas as a crucial practise for the essential energy body's purification. This school of thinking places an equal emphasis on indirect

contemplative techniques like meditation and movement-based contemplative practises like asana and pranayama. In addition to this classification, spiritual leaders such as Swami Vivekananda described yoga as a method of achieving contact with the sublime through a variety of techniques. These techniques include: Jnana yoga: using reason Bhakti yoga: cultivating feelings Karma yoga: elevating your deeds Raja yoga: consciously exercising one's will Many categories and fashion trends have emerged recently, each with its own variations depending on individual experiences and societal demands. The majority of them, nevertheless, are focused on one or more of the schools of thought described above. Only a small portion of the full range of yoga practises are movement-based, such as asana and pranayama. Since the great majority of practitioners primarily engage in the physical aspects, yoga is frequently associated with exercise. Even just looking at asana, there are notable distinctions between how physical movements are performed during yoga and physical activity. Because of this, it makes more sense to refer to yogasana as a movement-based contemplative practise or a psycho-spiritual activity than just a series of physical postures.<sup>[5,6]</sup>

### EFFECTS OF YOGA ON BODY FUNCTIONING

#### Yoga's impact on both mind and body

The benefits of yoga for the mind are numerous, and they depend on both the student's yoga practise and the teacher's ability to instil moral principles. The following are some mental effects of yoga's various elements: a. A great idea for starting and finishing the day with prayer is that it be done in groups. b. Yama and Niyama, being universal principles, have a significant influence on a person's inner calm. c. For experienced practitioners, asanas can be used as a kind of meditation when performed methodically and thoughtfully. d. Pranayama is an effective method for calming the mind and preparing it for more complex contemplative activities. e. Pratyahara, Dharana, and Dhyana slow down the mind's cognitive process and aid in focusing the mind. f. Samadhi is a state of oneness with the global mind and transcendence.<sup>[7]</sup>

Theoretically, when the autonomic nervous system gradually moves more towards the parasympathetic side or a balanced sympathetic-parasympathetic tone, mindful awareness of all the aspects of yoga leads to overall well health in a cascading fashion.

In a recent study, it was shown that practising yoga poses increased the brain chemicals oxytocin and brain derived neurotrophic factor (BDNF), which are important for cognition. Serotonin (5-HT) and BDNF are known to control neurogenesis, synaptic plasticity, and neuronal survival in the adult brain. According to Kinser et al. (2012), serotonin has been proposed as one of the neuromodulators mediating the effects of yoga, and studies showing that meditators have higher levels of serotonin than non-meditators corroborate this theory. In

middle-aged women with depression, laughter therapy was also found to raise serotonin levels. In individuals with low back pain, serotonin levels were observed to remain stable after yoga and to increase, along with a decrease in pain symptoms, indicating that yoga has a neuromodulatory influence on pain syndromes.<sup>[8]</sup>

### Respiratory system, or CRS

The inverted yogasana postures and pranayama are special among yoga activities in terms of their impact on the cardiorespiratory system. Inverted asanas like Sarvangasana, Halasana, and Sirsasana initially place a volume overload on the heart, but over time they paradoxically act by sensitising the baroreceptors, lowering heart rate and blood pressure, and are therefore advised for conditions like hypertension, though they should be practised with caution and under the supervision of a qualified teacher at the beginning stage.<sup>[9]</sup> Backward-bending poses like Sethubandhasarvangasana, Vipritadandasana, and Suptavirasana are effective angina relievers for people with ischemic heart disease. Pranayama is frequently confused with hyperventilation or deep breathing. By affecting the brain's chemoreceptor region, which is sensitive to carbon dioxide, pranayama has a special effect (CO<sub>2</sub>). The crucial step in pranayama is holding the breath (kumbhaka), which raises the CO<sub>2</sub> level (in the central chemoreceptor area) and lowers the oxygen level (peripheral chemoreceptor area). However, kumbhaka improves oxygen supply to tissues in terms of haemoglobin oxygen saturation. As all portions of the respiratory tract are engaged, the deep and slow breathing techniques of pranayama increase inspiratory and expiratory volume, vital capacity, and also reduce dead space. The psychological state of alert tranquility that is produced by the phase of kumbhaka with the best increase in CO<sub>2</sub> level is necessary for the practise of meditation.<sup>[10]</sup>

### Endocrine and neuromuscular systems

Most yoga poses are isometric, which promotes the red-slow twitch fibres (Type-I), retuning the muscles to a more energy-saving, slower mode that is suitable for entering meditative states. In other words, when yogasana practise retunes the muscle fibres away from type-II and towards type-I fibres, the neurological system shifts from sympathetic to parasympathetic dominance. This theory about yoga poses and muscle fibres is also supported by an experimental research. Another study indicated that practising yogasana greatly boosted aerobic power while dramatically decreasing anaerobic power.<sup>[11]</sup>

Yoga and aerobic exercise may differ in certain ways due to how they affect the HPA axis differently. While high-intensity exercise causes proportional increases in cortisol, low-intensity exercise tends to lower cortisol levels. As a result, yoga, which involves gentle, frequently non-strenuous movement, reduces sympathetic activation, which in turn lowers levels of the

stress hormones nor-epinephrine and epinephrine. Contrarily, it appears that aerobic exercise stimulates the sympathetic nervous system, increasing plasma levels of epinephrine and nor-epinephrine.<sup>[12]</sup>

### Immune system

The following explanations can be used to describe how yoga poses affect the immune system: A. Yoga practise strengthens the immune system since it generally shifts tone to the parasympathetic state. b. The practise of yogasana encourages the production of both red and white blood cells. d. Yogasana practise boosts immune function by enhancing circulation since a significant portion of the immune response involves the movement of infectious pathogens to the site of lymphocyte action. Many inverted yoga positions improve circulation by promoting venous and lymphatic evacuation. Positive thinking has been shown to easily raise the amount of B cells and T cells, whilst negative thinking might decrease their numbers. The practise of yoga poses while maintaining a state of attentive awareness results in a positive sensation and a feeling of wellbeing, which boosts the production of immune cells. Studies in conditions like cancer, which has a strong link to psycho-immunology, also support these claims. d. Yoga also seems to affect virus-specific immune responses and lower inflammatory indicators including C-reactive protein and interleukin-6.<sup>[13,14]</sup>

### Digestive systems (digestive, renal and reproductive)

Yoga asanas give the majority of the mesentery-held abdominal organs enough rest, especially in inverted poses like sarvangasana, which lessen the gravitational load on them. Regular use of positions like sarvangasana can help prevent issues like protrusion of the rectum and uterus. Renal problems benefit from positions like Paschimottanasana, which stretch the retroperitoneal organs, including the kidney. In their final positions, poses like Ardhamatsyendrasana, which incorporates an abdominal twist, form a distinctive geometrical shape that massages the liver and spleen among other organs. Acidity and flatulence can be treated with kriyas (cleaning techniques), such as Vamanadhouthi (regurgitative cleansing) and Shankhaprakshalana (cleansing of the entire digestive tract). Because it enhances mucociliary clearance, vamanadhouthi is widely suggested even for respiratory conditions like bronchial asthma. Nauli and Uddiyana induce a negative suction pressure in the abdominal cavity, which temporarily constricts the blood vessels and, upon release, provides the abdominal organs with a new, fresh supply of blood. Exercise Muscular and cardiorespiratory training are the main focuses of exercise.<sup>[15]</sup> If used moderately, it also has numerous advantageous effects on the majority of the aforementioned systems. Regular exercise, especially aerobic exercise, seems to strengthen the immune system and counteract weakened adaptive responses and ongoing inflammation. It's possible that intense exercise could lead to abrupt immunologic changes (such as decreased NK cell activity), which could

make some people more susceptible to infection. Regular, moderate activity lowers the risk of infection compared to a sedentary lifestyle, but extremely prolonged exercise sessions and times of intense training raise that risk. Additionally, it has been discovered that light exercise raises BDNF levels. Similar to how acute physical activity under conditions of low stress and light strain can effectively cause optimal neuronal activation, which is involved in the regulation of the serotonin system and has antidepressant and anxiolytic effects, while intense exercise may have the opposite effect. However, yoga practices include a variety of postures with varying degrees of gravitational effect that have an impact on particular organs. They also have a more general impact by changing the body's overall functioning from a rapid, stressful sympathetic mode to a slow, steady, relaxed but alert parasympathetic mode. Additionally, yoga techniques like uni-nostril breathing demand distinct voluntary control of the cerebral laterality.<sup>[16]</sup>

#### ADVERSE CONSEQUENCES AND SAFETY MEASURES

Yoga rarely has negative effects when performed under guidance. But occasional accidents or other outcomes have been documented, most frequently with the asana and pranayama elements. Although there is little research, several meditation techniques have been shown to exacerbate or trigger psychotic symptoms in susceptible individuals. Because of this, persons with a history of psychosis may want to avoid engaging in meditation activities. Muscle sprains are the most frequent asana-related injuries, and they typically stem from insufficient warm-up. Neurological problems, vascular injuries, and ligament injuries are a few more uncommon but reported conditions brought on by inappropriate asana practice without appropriate instruction. Inverted poses like Sirsasana, Sarvangasana, Halasana, etc. that have either hyper flexion or extension of the neck are more likely to cause neurological damage and vascular damage because they can affect the more delicate blood vessels (vertebral/basilar) or nerve plexus (brachial plexus) running across the cervical region. Excessive stretching can result in significant ligament damage, particularly to the knees, ankles, and shoulders. If pranayama is practised incorrectly and for an extended period of time, it can cause agitation, anxiety, and tremors.<sup>[17,18]</sup>

Exercise Compared to yogasana activities, exercise has a higher risk of injury due to the large variety of practices it encompasses, such as sports, gymnastics, athletics, weight lifting, etc. Depending on the type of exercise, it might be anything from a minor sprain to a major fracture.<sup>[19,20]</sup>

#### CONCLUSION

There are many similarities between physical activities and the physical aspects of yoga practices, but there are also significant variances. According to evidence, yoga

therapies are comparable to or even outperform exercise in almost all outcomes. Yoga activities are distinguished from physical workouts by their emphasis on breathing control, mindfulness during practice, and the preservation of postures. They also affect the body and the brain differently, both in healthy subjects and in people with a variety of physical and mental illnesses. Additionally, yoga has several benefits for improving mental health in the healthy population and for treating a variety of physical and neuropsychiatric illnesses as a solo or supplementary therapy. Yoga may not only be an appropriate supplement to treatment but also a legitimate, respectable, and successful substitute for physical activity. Yoga has benefits similar to exercise in that it is affordable, non-invasive, has a low risk of negative effects or drug interactions, does not need medical supervision or practice, and has the extra advantage of enhancing physical fitness. These features may boost patient preference and compliance and may entice patients who are hesitant or intolerant of using medication. Low-intensity exercise, like yoga, appears to have positive impacts on the body and mind. Research has to be done to elucidate the biological processes underlying each effect.

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