
5. Yoga for Immunity Enhancement to Protect Against Infections and Covid-19

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5.1 Introduction:

Health is a vital state of all living beings. For humans, health is not only about the physical form or condition, but there should be complete wellbeing at physical, mental, emotional, social level. Human being faces various health challenges from time to time. The communicable disease was the major health challenge during the 19th century; later, in the late 20th century, non-communicable diseases took over. We thought that communicable diseases are conquered with the advancement in modern medical care, and it would not be a major health challenge in the future. But due to the COVID-19 pandemic caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), our assumption about infectious diseases are failed. World health organization (WHO) has reported that globally nearly 1 billion people got infected, and 2.1 million deaths from SARS-CoV-2 till January 2021. Recently analyzed, the mortality rate is 5.7%.

These indicate that despite advancements in medical care, both non-communicable and communicable diseases are unresolved health challenges for humanity. To deal with such health challenges, multidimensional health care is essential. Various complementary and alternative therapies can be integrated with modern medical care for better health outcomes. Many of the alternative therapies like Ayurveda, Yoga, Homeopathy, Unani, Siddha, and various regional therapies have some potential to deal with current health care crises for infectious diseases.

Yoga is a spiritual discipline that originated in India, but in recent times it has gained worldwide popularity due to beneficial health effects on the mind and body. It is considered one of the mind-body medicine interventions and is widely practiced. It influences the mind and then body to bring wellbeing in all dimensions of an individual, including physical health. The present topic is exploring the effectiveness of Yoga to strengthen immunity so that the infections caused by various pathogens can recover soon and further prevent the acquiring of infections.

5.2 Psychological Stress and Immunity:

It is a well-accepted scientific fact that the mind influences body and vice versa. The field of Psycho-neuro-immunology investigates the relations and consequences of the interaction among the mind, brain, and immune system. Nervous, endocrine, and immune systems get influenced due to psychological stress or emotional disturbances. Psychological distress activates the autonomic nervous system (ANS) and the hypothalamic-pituitary-adrenal (HPA) axis. These stress-signaling pathways lead to physiological stress and contribute to immune deregulation. HPA axis and sympathetic-adrenal medullary axis stimulate the adrenal gland to release an adrenocorticotropic hormone that modulates immune functions. The immune system and its functions are very complex. Due to complexity, there are many ways they may set different types of pathways of pathogenesis.

Adaptive (acquired) immunity and innate (inborn) immunity defense mechanisms help to protect an organism from various bacteria, viruses, or other diseases like autoimmune disorders. Among various types of immune cells, T and B lymphocytes play a major role. T cells induce an immune response by producing various cytokines, and B cells produce antibodies against the antigens. Long time exposure to chronic stressors deregulates innate and adaptive immune responses by altering cytokine balance. It sets in inflammation and suppresses the immunity.

5.2.1 Psychological Stress and Infections:

Various research studies have demonstrated that psychological distress increases the susceptibility to various kinds of infections. One of the meta-analyses conducted on upper respiratory infections shows that psychological stress is associated with increased susceptibility to infections. Stress suppresses the host's resistance to infection and increases rates of infection. Another meta-analysis study on influenza vaccinated people reported that people having a high level of stress lead to a lower level of antibody response to influenza virus vaccination compared to less stressed people. Also, a study by Seiler et al., 2014 reported that negative emotions modulate the antibody and T cell response to antiviral vaccinations, resulting in suppressed immune responses. So stress is a significant risk factor for immune suppression or overexpression. It increases the susceptibility to illness after exposure to infectious agents. It also inhibits antibody and virus-specific T cell responses that lead to poor response to treatments.

5.2.2 Physical Activity and Infections:

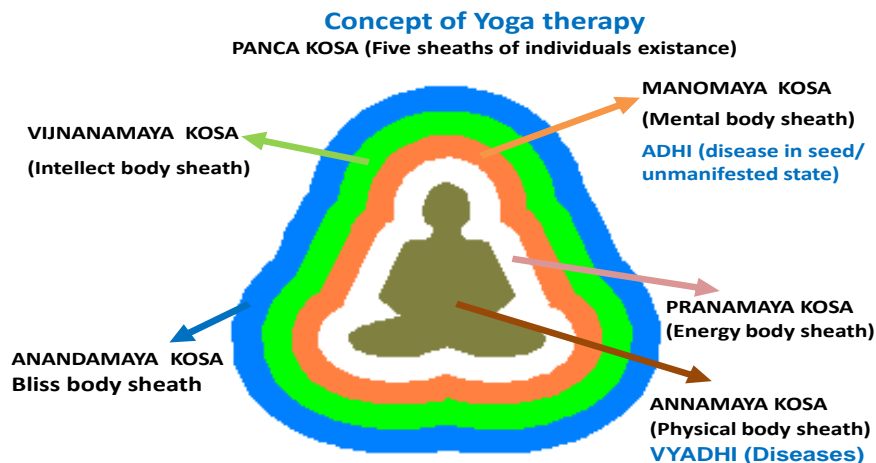
Physical inactivity is one of the root causes of various diseases. People who live a more sedentary life are more susceptible to multiple infectious diseases. Daily physical activity is an important component of a healthy lifestyle. Studies have shown the impact of physical activity on the enhancement of immune functions. Moderate to vigorous-intensity physical activity produce distinct and highly active immune cells that strengthen the immune response compared to physically inactive people. Epidemiologic studies reported that regular physical activity is associated with decreased incidence rate due to influenza and pneumonia. When the immune system acts against healthy cells and tissues in the body, it leads to various autoimmune disorders. Various types of physical activities are found useful for autoimmune diseases.

5.3 Introduction to Yoga:

Yoga is a spiritual discipline that focuses on bringing harmony between mind and body. The science of Yoga has its origin thousands of years ago. The philosophy of Yoga dates back to the pre-Vedic period (2700B.C), and it flourished rapidly as science, art, and a way of living between 500BC-800BC. Yoga is a technology for inner wellbeing and upliftment and did not hold on to any particular community, religion, or belief system. Yoga is also considered one of the (shad-darsana) six major treatises of Indian philosophy. The word 'Yoga' is derived from the Sanskrit root word 'yuj' that means 'Union'. Union or joining of individual consciousness with the universal consciousness.

In the words of Patanjali- Yoga is a process of gaining mastery over the mind 'Yogaha cittavrittinirodhaha' (PYS: 1.2). Sage Vasistha articulates Yoga as 'manaha prasamanopayaha yoga ityabhidheyate' (Yoga Vasistha: 3.9.32), which means- Yoga is a skillful trick to calm down the mind'. The Bhagavad Gita puts forth Yoga as 'Samatvam yoga ucyate' (2.48) which means- Yoga is a method that bestows the even-mindedness of mind in success and failures. Evenness is verily Yoga. 'Yogaha karmasu kousalam' (2.50) – 'Yoga is excellence in the action'. Swami Vivekananda mentions the four main streams of Yoga that lead to the same goal. These are Karma yoga, Bhakti yoga, Jnana yoga, Raja yoga.

Ashtanga yoga given by Patanjali explains a comprehensive & systematic approach for developing the body and mind. It includes-Yama and niyama (disciplines; don'ts and do's), asanas (the postures of the body), pranayama (the control and expansion of prana, i.e., the life force), pratyahara (withdrawal of senses from their objects of enjoyment), dharana (focusing of the mind), dhyana (deconcentration and defocusing), samadhi (super-consciousness, a state of oneness of meditator, object of meditation and act of meditation). Yoga practice harmonizes the different bodily functions and helps to bring the overall balance at the mind and body level. It works on all aspects of the individual: the physical, vital, mental, emotional, psychic, and spiritual. Though, in essence, Yoga is a spiritual path, but in modern times it has gained worldwide popularity due to its beneficial effects on all aspects of health and wellbeing.



5.3.1 Concept of Illness in Yoga:

Yogic texts (Taittiriya Upanishad) propound that humans exist not merely as the physical body, but in five layers called, Annamaya kosa, (The physical body sheath) Pranamaya kosa (Energy body sheath), Manomaya kosa (mental body sheath), Vijianamaya kosa (Intellect body sheath), and Anandamaya kosa (Bliss body sheath). In Anandamaya kosa, an individual is healthiest with perfect harmony and balance of all faculties. At Vijianamaya kosa, the mental faculties move but are aligned in the right direction. All the perturbations start at the Manomaya kosa level, which is the seat of our likes and dislikes. These likes and dislikes govern our actions and often in the wrong direction resulting in imbalances at the mental level. These imbalances are called adhi, which are not manifest at the physical level. But, gradually, these adhis causing mental instability start disturbing the prana flow in the nadis (energy channels) in vital layer and eventually manifest at the physical level in the form of various diseases called vyadhi (diseases). An individual's hereditary tendency also plays an important role in this process. So all the non-communicable diseases can be categorized as adhis.

Vyadhi are of two types – adhija and anadhija. Adhija vyadhi are twofold – samanya (ordinary) and Sara (essential). Samanya are psychosomatic illnesses, which are treated by suitable interventions or techniques. Sara adhija vyadhis are innate and carried from one birth to another. Realization of one's real nature gives freedom from the Sara adhija vyadhis. Anadhija vyadhis caused by infection, injuries, and natural calamities do not originate in the mind and are treatable through conventional medicines. Disturbance in mind can also hinder the healing process of the anadhija vyadhis.

The concept of vyadhi is elaborately explained by sage Vasistha to Sri Rama in Yoga Vasistha where the primary cause for the samanya vyadhi i.e., mental agitations, is described along with the treatment. Following the life of purity by adopting the path of sattva reduces the mental agitations, gradually promotes the free flow of prana, and, ultimately, the prevention or elimination of the diseases. Yoga emphasizes working on all levels, namely- manomaya, pranamaya, and annamaya kosha, for the quickest results. Therefore, an approach that brings balance at all levels needs to be followed for bringing the overall health.

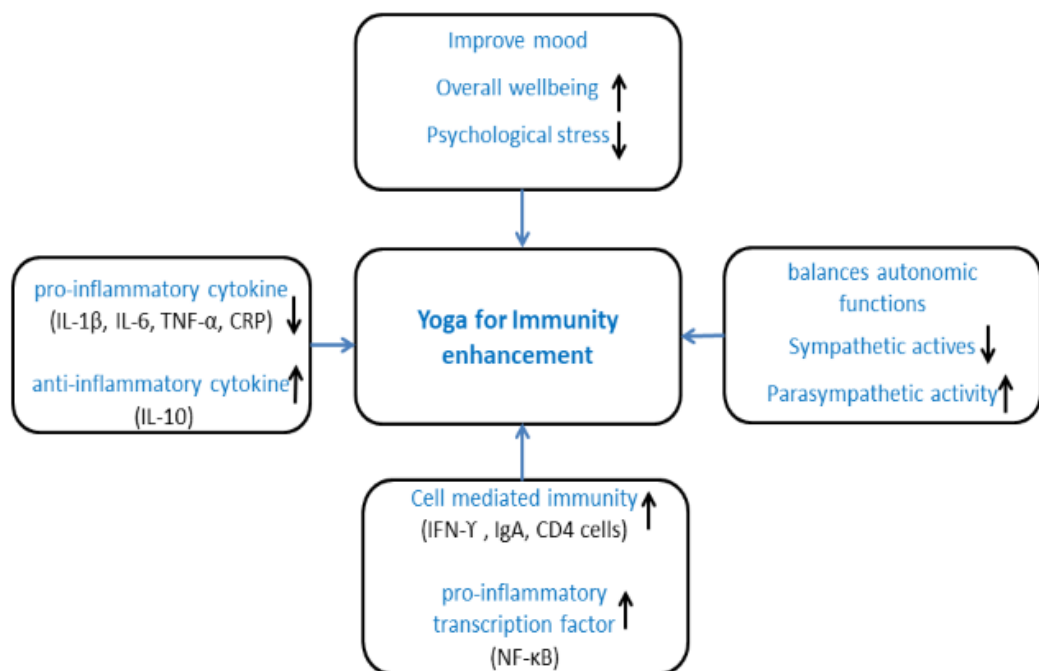
5.4 Yoga for Immunity Enhancement:

Clinical studies have demonstrated that yoga practices have a substantial effect on our immune system. Yoga practices decrease the pro-inflammatory markers like IL-6, TNF-alpha levels in the circulation. The long-term practice of Yoga has a protective impact on the immune system. A study conducted on long-term yoga practitioners reported a significant reduction in pro-inflammatory markers. Pro-inflammatory cytokines mediate the inflammatory response and are vital for an adequate immune function. Studies have also reported increasing anti-inflammatory cytokines like IL-10 etc., after the yoga practice. These effects of Yoga can be attributed to its impact on reducing the pro-inflammatory transcription factor nuclear factor kappa B and increasing the anti-inflammatory glucocorticoid receptor activity. Yoga practices also showed beneficial effects on cell-mediated as well as mucosal immunity. Yoga practice increases the IFN-gamma levels in healthy people and is a central regulator of cell-mediated immunity. It has antiviral, immune-regulatory, and anti-tumor properties. A randomized controlled study indicates that yoga practice can reduce eosinophil counts in asthma patients.

Studies conducted on HIV-infected subjects have shown an increase in CD4 count. There is an increase in IgA in pregnant women after yoga practice reflects that Yoga has the potential to protect against invading pathogens.

These effects of Yoga on immune system mediated via Psycho-neuro-immunological and hypothalamic-pituitary-adrenal pathways. Yoga practices reduce psychological stress and improve mood. It slows down the sympathetic activities and brings balance in autonomic functions. As stress, glandular secretions like glucocorticoids, sympathetic over activity are the root causes for the altered state of immune function. Different yogic practices have an effect on all the levels simultaneously, which gives better outcomes. The immune system is hyperactive against our own body in autoimmune disorders and allergies. Yoga practices reduce the immune reaction in such conditions against the body. When the immune response is suppressed against infections after yoga practice immune response gets strengthened. This indicates Yoga has the capability to establish homeostasis in the immune system.

Figure 5.1: Mechanism of Yoga for Immunity Enhancement.



5.5 Yoga as an Adjunct for Prevention and Recovery from COVID-19:

Yoga is a way of living in harmony within ourselves and nature. Since ancient times, it has been practiced in various forms. In recent times traditional Hatayoga practices are widely used for health benefits. Researches indicating Yoga is effective in strengthening immunity through various pathways. Infection of coronavirus causes mild to acute symptoms like fever, cough, fatigue and further leads to the mild or acute respiratory syndrome. Due to this, releasing various pro-inflammatory cytokines causes lung inflammation. Depending on the severity of cytokine storm and active immune response decide the course of disease progress or recovery. Appropriate antiviral drugs and the development of vaccines will help to a larger extent for its effective management.

However, the certainty of the effectiveness of antiviral drugs and associated adverse effects is unclear. Also, controlling and preventive measures should be implemented in a judicious and cost-effective manner. By investigations, it is observed that T cell counts are reduced during coronavirus infection, and surviving T cells are get exhausted and unable to function effectively. Earlier evidence of Yoga interventions supports that it effectively reduces the inflammatory cytokines and increases the T cell count. Efficacy of Yoga in various communicable diseases like HIV, tuberculosis, and acute respiratory illnesses is proven that Yoga helps to enhance immunity. Due to COVID-19 pandemic, people have a high level of psychological distress due to various reasons. Stress weakens immune competence through immunosuppression. Psychological health essential to have good immunity. Yoga interventions for proven their effectiveness for promoting psychological health in healthy and psychologically ill persons. Yoga practices help in all dimensions of health that is physical, psychological, and spiritual. So, can be used as an adjunct to prevent COVID-19 along with other health measures. Also, it will be effective to recover from infection along with conventional care.

5.6. Yoga Practices for Immunity Enhancement:

- The cleansing technique (Kriyas)- Kapalbhati, Neti, Vamana dhouti, Shankhprakhshalana
- Physical postures (Asana)- Loosening and strengthening asanas, Surya namaskar.
- Breathing practices (Pranayama)- Nadishodhana, Bhramri, Bhastrika
- Chanting (Nadanusandhana)
- Meditation (Dhyana) and Relaxation

Learning these practices from a trained yoga teacher or therapist is essential before doing these practices. It will help the practitioner to do it correctly and for greater benefits. The practice of Asana for half an hour, pranayama for fifteen minutes, and meditation for fifteen minutes all together one-hour daily practice will enhance immunity and overall health.

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