



Review Article

PHYSIOLOGICAL EFFECT OF YOGA ON DIFFERENT BODY SYSTEMS**Bhanu Pratap Singh^{1*}, Deepa², Om Prakash Dadhich³**¹MD Scholar, ³Associate Professor, Dept. of Sharir Kriya, National Institute of Ayurveda, Jaipur, India.²MD Scholar, Dept. of Sharir Rachana, National Institute of Ayurveda, Jaipur, India.**KEYWORDS:** Exercise, Meditation, *Yogasana*, Physiological effects.**ABSTRACT**

The life style of men changed due to technological modernization and advancement of science. Increased standard of living has brought a great comfort to mankind but they are worried about health. Everyone is sick having either physical or mental problem. *Yogasanas* are one of the important parts of yogic exercises which contribute to physical as well as mental health. *Yoga* is a mind body practice that combines stretching exercises, controlled breathing and relaxation. It is considered a mind body type of complementary and alternative medicine practice. The health benefits of *Yoga* with a regular practice of *Yoga* poses, breathing exercise and meditation is grouped into three kinds: physiological, psychological and biochemical effects. *Yogasanas* have an equal balancing effect on all organs simultaneously without making an effort to think about different parts and internal organs of the body. *Yogasanas* have a combined effect on all the systems simultaneously. Chiefly *Yogasanas* cause positive effects on digestive system like *Padmasana*, *Vajrasana*, *Gomukhasana* etc. If we talk about respiratory system, a regular practice of deep *Pranayama* and *Shavasana* help to regulate inspiration and expiration. In endocrine system, *Yogasanas* regulate and control the secretion of hormones from all glands in the body. Regular practice of *Yogasanas* promotes purification and circulation of blood in different systems of the body. Likewise here are some physiological benefits of *Yoga* that can get through a regular *Yoga* practice.

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INTRODUCTION

Yoga is one of the oldest sciences of Indian origin but now it has become a visible part of our diversifying culture that we all have encountered in one form or another. *Yoga* as a popular exercise trend, *Yoga* as an alternative medical therapy and *Yoga* as a profound spiritual path all color our vision of *Yoga*. *Yoga* is a psycho-somatic-spiritual discipline for achieving union and harmony between our mind, body and soul and the ultimate union of our individual consciousness with the universal consciousness.

Etymologically the word *Yoga* is derived from the Sanskrit root "*Yujira yoge*" meaning to unite, to combine or to integrate¹. According to *Patanjali*, *Yoga* is a stage in which all the activities of mind get stabilized. According to *Bhagvad Gita*, '*Yogah karmasu kaushlam*' means *Yoga* is a skilled performance and '*Samatvam Yogamuchyate*' means state of balance between body and mind is *Yoga*.

Ashtanga yoga

Patanjali's Ashtanga yoga consists of eight limbs or portions-*Yama*, *Niyama*, *Asana*, *Pranayama*, *Pratyahara*, *Dharana*, *Dhyana* and *Samadhi*.²

- 1. Yama-** The *Yamas* are practices to eliminate wrong, harmful or disturbing behaviour. They create a foundation of right living, peace and harmony both socially and personally. With these five *Yama*, *Yoga* provides a simple model of self discipline. These five *Yamas* are-*Ahimsa*, *Satya*, *Brahmacharya*, *Asteya* and *Aparigraha*.
- 2. Niyama-** The *Niyamas* are principles of personal practice both for self healing and self development. Five *Niyamas* are-*Shaucha*, *santoshya*, *tapa*, *svadhyaya* and *Ishvara pranidhana*.
- 3. Asana-** *Asana* consists of physical postures and movements to release tension, toxins and prepare the mind for meditation.
- 4. Pranayama-** They consist of specific types and ratios of breathing practices. *Asanas* puts the body in a state of balance so that we can work on our *Prana* through *Pranayama*. *Pranayama* extends to all means of developing and controlling *Prana* in the body and mind.
- 5. Pratyahara-** *Pratyahara* refers to various methods of managing impressions and controlling the senses

that are our main source of contact with the external world. Most *Pratyahara* methods consist of withdrawing from external sensory overload and accessing peace and silence within ourselves. Deep relaxation is also part of *Pratyahara*, which involves putting the motor organs to rest.

6. **Dharana-** *Dharana* consists of concentration practices that focus and stabilize our attention. Attention is the main power of the mind. Typical *Dharana* methods consist of concentration on various *Chakras* or holding our gaze on particular objects, until our mind becomes steady. Concentration is the foundation for meditation.
7. **Dhyana-** *Dhyana* refers to meditation, which is a sustained concentration or deep reflection on a particular object of thought. Through holding a 'one pointed' attention, we can arrive at a deep understanding of the reality. Meditation is the main method of classical *Yoga* that aims at controlling the mind.
8. **Samadhi-** *Samadhi* consists of merging the mind with the object of its attention, which occurs naturally through prolonged meditation. Once the mind becomes one with its object we experience profound peace and blissful happiness. It is the ultimate goal of *Yoga* practice that arises through long term meditation. *Yoga* shows us how to approach this internal state of bliss in a step-by-step manner working with body, *Prana*, senses, mind and heart.

Physiological effect on different body systems

The human body is a complex creation of nature. It is made up of many complex systems working together in harmony. If any of the systems faults, the entire machinery starts to suffer in order to maintain proper functioning of all systems. It is important to do proper maintenance of the body so that it remains healthy throughout life. The best way to maintain good health and longevity of the body is to practice *Yogasanas*. *Yoga* is a holistic therapy which aims at achieving overall physical, mental and spiritual well being³. *Yogasana* is a sophisticated system of energy management. The energy of each position is learned through the repeated experience of the pose. *Yogasanas* have an equal balancing effect on all organs simultaneously without making an effort to think about different parts and internal organs of the body. *Yogasanas* have a combined effect on all the systems simultaneously. These are following.

1. Digestive system

The major functions of the digestive system are ingestion, digestion, absorption, and defecation. The entire digestive system is benefited from *Asanas*. The muscles of digestive tract are massaged and toned. The movement enhances blood supply to the various internal organs. The movements during *Asanas* individually benefit organs like pancreas, liver, gall bladder etc.⁴ Regular practice of *Yogasanas* activates the

contractibility and physiological activity of stomach. Secretion of gastric juices and hormones are increased. This helps to normalize the digestive processes. Through various studies it has been observed that by *Yogasanas* the peristaltic activity of intestine is increased⁵. Moreover the absorbing capacity of villi of small intestine is promoted by *Asanas*. As a result of which adequate amount of nutrients are absorbed and desired supply of nutrition is made available to respective part of the body. *Yogasanas* help to regulate these body processes which thereby control gastric disorders such as constipation, indigestion and acidity. Chiefly *Yogasanas* cause positive effects on digestive system including *Udar shakti vikasak kriya* are *Padmasana*, *Vajrasana*, *Gomukhasana*, *Dhanurasana* and *Ardhayamatyasendrasana* etc⁶.

2. Respiratory system

A regular practice of deep *Pranayama* and *Shavasana* help to regulate inspiration and expiration, which in turn provides adequate amount of oxygen in the body. Oxygen gets attached to blood and circulate in the entire body. A regular practice of *Pranayama* helps to prevent the infestation of bacterial infection in the lungs; especially the saprophytic bacteria prevented which subsequently cause tuberculosis⁷. Apart from this, the practice of finer techniques of *Pranayama*, helps to relieve pulmonary disorders, such as tuberculosis, bronchitis, pneumonia etc. During various positions of *Asanas* breathing is sometimes increases, sometimes lowered and sometimes controlled allowing one to breathe in different capacities. Due to stretching, the capacity of lungs is enhanced. The elasticity of lungs, intercostals muscles are increased which help in improvement of the performance of the system. The breathing exercise allows more intake of oxygen which enables burning of excess of calories easily. The diaphragm, muscles and cartilages are toned.

3. Endocrine system

The endocrine system is active in regulating metabolism, growth, development, puberty, tissue function and also plays a part in determining mood. *Asanas* keep the mind calm and at ease. It has been revealed that various meditative *Asanas* especially *Padmasana* helps to regulate endocrine secretion of serotonin and dopamine⁸. Glands located in many regions of the body, release chemical messengers called hormones into the bloodstream. *Yogasanas* regulate and control the secretion of hormones from all glands in the body. When we do *Asanas*, we try to concentrate on breath, various body parts or infinity which is controlling the mind and taking it away from the stressful thoughts and emotions, this balances the mind resulting in calm and peaceful state. The reduced mental activity reduces cortex activity and increases dopamine secretions in the blood. This sends positive signals to the hypothalamus which then leads to more effective function of glands and hormone secretions. When the endocrine system functions properly, the whole body benefits. In such persons in whom there is more secretion of adrenaline and cortisone, meditative *Asanas* such as *Padmasana*

helps to control such secretions. This helps to control serious disorders, such as high B.P., stress and anxiety. Thus every *Asana* regulate one or the other endocrine gland and thus offers physical and mental health and alleviate disorders.

4. Nervous system

By improving blood circulation, easing muscle tension and focusing the mind on the breath, *Asanas* combine to ease the nervous system. Long-term benefits include reduced stress and anxiety levels and increased feelings of calm and well-being. Hyperactivity of parasympathetic nervous system results in aggressiveness and criminal behaviours in a person. On the other side hyperactivity of sympathetic nervous system leads to inferiority complex and down with undue terror⁹. With the result of *Yogasanas* the activity of both these nervous systems are well regulated and balanced which leads to progressive growth and development of the person. The spine is kept flexible through various kinds of *Yogasanas* and there is much less chance of spinal misalignments.

5. Cardio vascular system

Regular practice of *Yogasanas* promotes purification and circulation of blood in different systems of the body. An accelerated blood flow during *Yoga* practice help to deplete various harmful deposits such as cholesterol in the blood vessels¹⁰. During *Asanas*, the blood vessels are stretched and the flow of blood is increased through them. The increased blood flow to various organs facilitates proper functioning. Due to massaging of internal organs during *Asanas*, blood is pumped up by the heart which activates all organs and also enhances movement of nutrients in and out of cells through the fluid present in interstitial space. Regular *Yoga* practice may help the blood pressure to normalise. It strengthens the heart muscles thus resulting in better circulation and less possibility of heart diseases. Thus *Yogasanas* help to prevent various disorders related to circulatory system.

6. Skeleton system

The human skeleton supports the softer parts of the body such as muscles, which are attached to it and the organs, which it protects. The gentle stretching of the muscles and joints releases muscle tension, thus increasing flexibility. The stretching of the joints in *Asanas* causes the secretion of a lubricant called the synovial fluid. This fluid is released into the joints that keep them supple. The result is to reduce stiffness, which will prevent arthritis or improve it if the person already suffers from the condition. Maintaining many of the *Asanas* encourages strength and endurance. Weight bearing *Asanas* usually help prevent osteoporosis. Long term benefits of *Asanas* include reduced back pain and improved posture. A regular practice of *Yogic Asanas* and *Yogic* processes tones up muscles and offers flexibility. *Yogasanas* balance the body by bringing the appropriate tone and suppleness to the musculature. They strengthen muscles that are weak and stretch muscles that are tight.

They adjust the muscles, ligaments and tendons ensuring their proper functioning. It normalizes the physiological activities of muscles. Moreover, at minute levels it reconstitutes any damage to muscles. *Yogasanas* accelerate the oxygen supply to blood and thus promote the normal catabolism of glycogen to release desired level of energy. This helps to regulate the lactic acid level in blood and energy based different metabolic processes continue in a normal manner.

7. Other physiological effects¹¹

- During *Yogic* practice the mind and body work in co-ordination with each other. The mind has a control over the cells and becomes aware of any prevailing ailments or malfunctioning of any body parts.
- The *Yogic* movements are synchronised in such a manner that all parts are brought into motion and the entire body acquire a fit and healthy, attractive shape.
- During *Asanas*, the joints are mobilized and while moving they are lubricated.
- During *Asanas*, the entire body is stretched which activates the nerve endings in skin, also the blood vessels are activated and due to enhanced blood flow, the skin acquire a glow.
- Regular *Yogic* practice enhances the power of the sense organ that is eye, ear, nose, tongue and skin with increased power. The sense organs help in better perception of stimuli of internal and external environment and enhance responses.
- Due to practice of *Yogasanas* blood flows to the cells due to which toxins are released. Due to massage of internal organs and increased blood flow, oxygen intake in cells is increased which causes release of energy, thus decreasing toxicity within cells and tissues caused due to accumulation of carbon dioxide and other free radicals.

CONCLUSION

Yoga is gradually being welcomed into modern health care systems as an understanding of its multifarious benefits is gaining ground worldwide. It provides us with individual and social well being, physical fitness, intellectual awakening and mental peace. *Yogasana* promotes physical health and longevity by

- Balancing the muscles in relationship to each other and relative to their appropriate function.
- Maintaining the health and integrity of the joints and spine.
- Managing the energetic system of the body.
- Relaxing, strengthening, stretching and energizing the body.
- Cleansing and nourishing the body on every level.

- Toning and nourishing every bodily system: endocrine, nervous, cardiovascular, digestive and skeleton system.

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