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## Physiological basis of yoga and pranayama

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### Abstract

Physiology deals with the functions of the body, mechanisms of the human body that make it a living being. It is the study of functions of normal body, includes the study of different chemical, physical changes taking place in the normal body. Asana are also called as postures. There are over 84 asana and each one of them has a different technique of performing and they are also named differently. Each yoga asana tends to heal the body in a different manner. The process of respiration has three components. Pooraka is inspiration of air, kumbhaka means retention, and rechaka is expiration. It can be said that kumbhaka is pranayama and pranayama is kumbhaka, not pooraka and rechaka, which are natural processes. Kumbhaka is again of three types. Bahir kumbhaka is retention of breath at the end of expiration. It is very necessary to keep the body healthy and fit inside out. Yogasanas are done for keeping the internal and external parts of the body healthy. Yoga asana are carried out to get relief from pain and bring about improvement from various disorders. It can improve the blood circulation in the body and allow unrestricted flow of blood to various parts of the body. Yoga asana are also essential for removing the toxins or negative blocks in the body. Breathing techniques and patterns are regularly advocated for relaxation, stress management, control of psycho physiological states and to improve organ function. Yoga and Pranayama reduces sympathetic dominance/increased parasympathetic activation, Reduces blood pressure, Reduces resting heart rate, Reduces cholesterol, Reduces blood glucose levels, Improved lipid profile, Decrease body weight, Increase core stability, Improve balance, Improve lung function, Improve breath control and Reduce chronic pain, including lower back pain.

**Keywords:** Physiological basis, yoga, pranayama

### Introduction

Physiology deals with the functions of the body, mechanisms of the human body that make it a living being. It is the study of functions of normal body, includes the study of different chemical, physical changes taking place in the normal body. The goal of physiology is to explain the physical and chemical factors that are responsible for the origin, development and progression of life. Yoga asana are called as non violent activity as less amount of energy is expended while doing the yoga poses. Hence the person does not feel tired. Yoga asana are simple and trouble free that can improve the strength and endurance of the body. Certain positions like standing, twisting, bending and balance help in gaining the balance of the mind and the body.

Asana are also called as postures. There are over 84 asana and each one of them has a different technique of performing and they are also named differently. Each yoga asana tends to heal the body in a different manner. Performing yoga asana regularly brings about a condition in which there is effective functioning of the organs in the body. These functions are intelligently controlled by our mind. Asanas are supposed to have the capacity of maintaining a proper balance in the body system. Yogasanas can be performed by any person, irrespective of age or sex.

The process of respiration has three components. Pooraka is inspiration of air, kumbhaka means retention, and rechaka is expiration. It can be said that kumbhaka is pranayama and pranayama is kumbhaka, not pooraka and rechaka, which are natural processes. Kumbhaka is again of three types. Bahir kumbhaka is retention of breath at the end of expiration. Antar kumbhaka means holding the breath after inspiration of air, and kevala kumbhaka or sahaja kumbhaka implies holding the breath with no particular state of respiration in consideration. Kevala kumbhaka is one of the final stages of yoga parallel with the state of samadhi.

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Bahir kumbhaka is not used very often. Hence we shall consider antar kumbhaka i.e. retention or holding the breath after fully inspiring or taking in air.

It is very necessary to keep the body healthy and fit inside out. Yogasanas are done for keeping the internal and external parts of the body healthy. Yoga asana are carried out to get relief from pain and bring about improvement from various disorders. The yoga postures can also help to bring flexibility to the joints and tendons. It can improve the mental wellbeing of the body. Yoga asana are useful in carrying out various functions in the body harmoniously. Achievement of harmony in the body activities can result in development of flexibility. When different asana are carried out systematically, it can help in massaging the organs and improving its functions thus enhancing the health of the individual.

It can improve the blood circulation in the body and allow unrestricted flow of blood to various parts of the body. Yoga asana are also essential for removing the toxins or negative blocks in the body. It can help in toning the muscles and improving the strength of the muscles. Asana are considered as effective stress busters that can relieve an individual from tension and worry. The slow breathing exercises and meditation carried out can help in relaxation thus improving the quality of life. With yoga asana ageing is delayed and the person may look young from outside as well from inside.

Breathing techniques and patterns are regularly advocated for relaxation, stress management, control of psycho physiological states and to improve organ function (Ritz and Roth, 2003). Anatomically speaking there is a favorable equilibrium (balance in breathing pressures) with breathing, which can be easily disrupted by fatigue or prolonged sympathetic (excitatory) nervous system arousal as seen with stress. One therapeutic goal of yoga is that it may reduce or alleviate some of the chronic negative effects of stress. This stress relief is one reason that breathing, or pranayama as it is called in yoga, is very central to yoga practices. This article will endeavor to explain the physiological mechanisms and the mind-body connection of breathing, as well as many of the research driven applications utilized with breathing. Fitness professionals and personal trainers will become more aware of the truths and myths of breathing, and related conditions, so that they can better guide and teach their students and clients.

#### **Physiological Benefits of Yoga and Pranayama**

- Reduced sympathetic dominance/increased parasympathetic activation
- Reduced blood pressure
- Reduced resting heart rate
- Reduced cholesterol
- Reduced blood glucose levels
- Improved lipid profile
- Decrease in inflammatory markers
- Improved endothelial function
- Decreased body weight
- Reduced waist-hip ratio
- Increased strength
- Increased core stability
- Improved balance
- Improved lung function
- Improved breath control
- Improved immune system function
- Reduced muscle tension
- Reduction in chronic pain, including lower back pain

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