

The Science of Pranayama

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PRANAYAM / BREATHING EXERCISES

In yogic terms prana means the vital energy and ayam means exercise. Pranayam defines the regulation of the in and out flow of this vital energy. It explains that the body, breath and the mind are intricately interwoven. When the air moves the mind moves and when the air is stilled the mind also could be stilled. Hence the various techniques employed in Pranayam are to stabilize the flow of air thus to achieve the balanced state of mind.

PREPARATION BEFORE THE PRACTICE

All breathing exercises are done in empty stomach usually after a warming up of the body by stretching exercises, sun salutation or yoga poses. One has to sit in any comfortable meditative posture and place the back and neck erect. Little deep breathing is carried out to relax the muscles after any of these practices. The inhalation and exhalations are to be performed through the nostrils

TRAINING THE RESPIRATORY MACHINE

Abdominal / Diaphragmatic breathing

Here only the abdomen is focused upon during breathing. Inhale and expand the abdomen, exhale and suck the abdomen in. This exercise is repeated for 9 rounds. To feel the expansion of abdomen, hands can be placed over the stomach

Thoracic / Intercostal breathing

Here the attention is given to the chest. Inhale and expand the chest, exhale and retract the chest. Repeat for 9 rounds.

Clavicular or Shoulder breathing

This is to aerate the upper lobe of the lungs. Inhale and raise the shoulders, exhale and drop it down. Arms stretched sideways, inhale and raise the arms above the head to join the palms; exhale and release the arms till the shoulder level.

Balancing Pranayama - Nadisuddhi Pranayama

Here the inhalation and exhalation are done through alternate nostrils. Sit erect in any meditative pose with back and neck straight. Fold your index and middle finger of the right hand to use the ring finger and thumb to block the left and right nostrils respectively. Block the right nostril with the thumb. Inhale slowly and deeply from the left, counting 1,2,3,4 mentally; block the left nostril with the ring and little fingers after inhalation and breathe out through the right nostril by counting 1,2... 6. Again breathe in through the right nostril and breathe out through the left nostril with the same ratio and repeat the same procedure for 9 rounds. This technique helps to purify the nadis (nerves) and Chakras (nerve plexus) and also helps to make the body feel light and balanced.

Ujjayi / Hissing Pranayama

Sit erect in any meditative pose. Inhale from both the nostrils by feeling the air at the upper palate. This is done by partially closing the glottis. Hold the breath internally for a while; make a chin lock by bending the neck forward to touch the chest with the chin. While holding feel the air blocked below the throat. Release the chin lock partially and exhale through the left nostril continuously by producing the hissing noise with the partial closure of the glottis. Release the chin lock by lifting the head slowly up as you exhale. Repeat this cycle for 9 rounds. This will help to check the blood pressure by stimulating the carotid receptors and also will help to improve the circulation to the thyroid and parathyroid glands.

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Surya bhedana Pranayama

It is also called as right nostril breathing. This is a heating Pranayama. Block the left nostril and inhale from the right nostril deeply, now block the right and exhale through the left nostril. Repeat the practice for 9 rounds. Here the internal and external retention can be done for 2 seconds. Not advised in hypertension and in other cardiac illness.

Chandra bhedana Pranayama

This is also called as cooling Pranayama. Block the right nostril; inhale from the left nostril deeply and continuously, then block the left and exhale through the right nostril. Repeat the practice for 9 rounds.

Bastrika Pranayama

Sit in Vajrasana- active inhalations and exhalations with the in and out (flapping) movements of the abdomen called as strokes. Three rounds of bastrika with increasing speed. Normal breathing in between the rounds. The strokes vary from 20 - 40 per round.

Brahmari Pranayama - The Humming Bee Pranayama

Inhale deeply from both nostrils. Use the index fingers to block the ears and when you exhale, try to produce the humming sound of a female bee from the mouth and nose and feel the vibrations of this sound in the head and neck region. Repeat for 9 rounds.

In a fast paced age where stress and depression are widespread, the toll of stress on physical and mental health can be extremely high.

Stress, anxiety and depression are known to be significant factors in the onset and progression of a wide spectrum of illnesses ranging from cancer and HIV-1 infection, to asthma and cardiovascular disease.

Pranayam and its accompanying practices are time-honored stress management/health promotion techniques whose health benefits are being validated by modern medical science.

Independent research has shown that significantly:

Reduce levels of stress (reduce cortisol - the “stress” hormone)

Benefit the immune system

Reduce cholesterol

Relieve anxiety and depression (mild, moderate and severe)

Increase anti-oxidant protection

Enhance brain function (increased mental focus, calmness and recovery from stressful stimuli)

Enhance health, well-being, and peace of mind

These simple, yet powerful breathing practices have a unique advantage over many other forms of treatment: they are free from unwanted side-effects, cut health care costs, and are easy to learn and practice in daily life.

investigation of the pranayam as they relate to physical, social, and emotional well-being. We welcome research collaborations and suggestions from interested parties.

The Science of Breath - Summary of Key Findings

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Research Summary-

Improved Brain Function

To study the long-term effects of pranayam on brain function, EEG (electroencephalogram) changes were recorded in 100 pranayam practitioners outside of the practice of pranayam and compared with EEG patterns of 16 controls (doctors and researchers who did not practice pranayam yoga, or meditation).

Significant increases in beta activity were observed in the left frontal, occipital, and midline regions of the brain in the pranayam practitioners, as compared to controls. These results are interpreted by neurologists as indicative of increased mental focus/heightened awareness in pranayam practitioners.

EEG activity was also studied during the practice of pranayam in five females of similar age, socioeconomic, and educational backgrounds.

This study found an increase in EEG alpha activity, with interspersed persistence of beta activity. This indicates a state of relaxation co-existing with heightened alertness.

Effect on Cortisol, the "Stress Hormone"

Several studies have demonstrated significant falls in cortisol levels. In one study, blood cortisol, known as the "stress hormone," was measured in 121 individuals, 28-50 years of age. Regular pranayam practitioners (Group 1) were compared with beginning practitioners (Group 2) during their pranayam sessions.

The beginning practitioners were also measured before learning pranayam, while listening to classical music (Group 3). Among beginners, the fall in cortisol levels was significantly greater during pranayam than when listening to classical music, suggesting that pranayam produces a better relaxation response.

The significant further fall in serum cortisol levels, during and following pranayam, among beginning and regular practitioners, suggests that regular practice of pranayam progressively develops greater levels of both relaxation and resilience to stress.

Effect on Blood Lactate

(Indicator of stress and tension)

They undergo intense physical and emotional training daily. Blood lactate was measured in 10 such individuals, both before learning pranayam and after the first session. There was a significant fall in lactate levels after pranayam, suggesting that it induces a state of relaxation.

Effect on Immune Function

Natural killer (NK) cells are believed to be important in the body's defense against new and recurring cancers. NK cells are the surveillance cells of the immune system and are capable of destroying tumor cells as well as infected cells. NK cells were counted in the peripheral blood of three groups: pranayam practitioners, normal individual's not practicing pranayam, and cancer patients in remission. NK cells were significantly higher in the pranayam group than in either non-practicing individuals or in cancer patients in remission. The cancer patients then learned pranayam. After 3-6 months of regular practice, there was a significant increase in the cancer patients' NK cell count.

Effect on Antioxidant Enzymes

Free radicals can react with oxygen and cause oxidant damage, contributing to many diseases, including cancer and such cardiovascular diseases as heart disease and stroke.

To counteract these free radicals, the human body has a defense system in the form of antioxidant enzymes. A study was conducted to assess the effect of pranayam on antioxidant enzymes. Levels of three major antioxidant enzymes-superoxide dismutase (SOD), catalase, and glutathione-were all

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found to be significantly higher in pranayam practitioners than in the matched control group, which suggests that people who practice pranayam have an improved antioxidant status and an enhanced defense against oxidant damage.

Effect on Blood Cholesterol

Psychosocial stress is a major contributor to hypertension and coronary heart disease (CHD). In CHD, deposits of LDL cholesterol, fat, and other substances on the arterial walls slow or block the flow of blood, resulting in heart malfunction. A study was conducted to assess the cholesterol levels of individuals before they learned pranayam, as well as after 14 and 90 days of regular practice.

Significant drops in total cholesterol and LDL (harmful) cholesterol, as well as increases in HDL (beneficial) cholesterol were observed. These findings suggest that pranayam improves the blood cholesterol profile, and that regular practice may therefore prove to be an effective tool in preventing and arresting hypertension and CHD.

Effect on Depression

Pranayam has been shown to have a 62%-79% success rate in the treatment of depression, regardless of severity.

Relief from depression, determined by psychiatric evaluation and standard psychiatric measures (Beck Depression

Inventory, Hamilton Rating Scale for Depression, and others) was experienced within three weeks.

Published studies further suggest that pranayam normalizes patients' brainwave patterns, increases serum prolactin (a "wellbeing" hormone), and is as effective as standard antidepressant drug regimens. Yet it is safe, free of unwanted side effects, cost effective, and self empowering

For more details, please visit www.hindupriest.com read about pranayam.