Pranayama

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Abstract **- Thousands of years ago yoga originated in India, and in present day and age, an alarming awareness was observed in health and natural remedies among people by yoga and pranayama which has been proven an effective method for improving health in addition to prevention and management of diseases. With increasing scientific research in yoga, its therapeutic aspects are also being explored. Yoga is reported to reduce stress and anxiety, improves autonomic functions by triggering neurohormonal mechanisms by the suppression of sympathetic activity, and even, now-a-days, several reports suggested yoga is beneficial for physical health of cancer patients. Such global recognition of yoga also testifies to India's growing cultural influence.**

Index Terms **- Anxiety, cancer, hypertension, pranayama, stress, yoga.**

INTRODUCTION

Pranayama is the yogic practice of focusing on breath. Prana means "vital life force", and yama means to gain control. In yoga, breath is associated with the prana, thus, pranayama is a means to elevate the Prana shakti, or life energies. In texts like the Bhagavad Gita and the Yoga Sutras of Patanjali, and later in Hatha yoga texts, it meant the complete suspension of breathing. Pranayama is one practice that has been found to be effective to physiology of mankind in many ways.

"Pranayama is control of Breath.'' Five types of prana are responsible for various pranic activities in the body, they are Prana, Apana, Vyan, Udana & Samana. Out of these Prana and Apana are most important. Prana is upward flowing and Apana is downward flowing. Practice of Pranayama achieves the balance in the activities of these pranas, which results in healthy body and mind.

Breath training is essential as it purifies the energy channels in the body. Besides, relaxing the nervous system and strengthening the body, mind and emotional immunity. Understanding the stages of pranayam helps improve the breath awareness.

The 3 Stages of Pranayam as per Yoga Sutras

Puraka (Inhalation)

Inhalation in puraka is done in a very smooth way by keeping the force uniform. The speed at which the lungs are filled is regulated. As in, when one increases the duration and prolongs the phase of inhalation, the force is automatically decreased.

In order to bring necessary proportion in kumbhaka and rechaka; the duration of puraka has to be well-adjusted.

Kumbhaka (Retention)

Kumbhaka is a voluntarily controlled suspension of breath. After regulated inhalation, the air is retained for a certain period of time (Antar Kumbhaka).

Bahya kumbhaka is when the breath is held for several seconds after the exhalation is complete. This is often used in meditation and bandha practice.

Both types of kumbhaka increase heat in the body and provide a range of physical and mental health benefits.

Rechaka (Exhalation)

The last phase of Pranayama is the Rechaka phase. Which is a voluntarily controlled exhalation as compared to the normal exhalation. Usually in pranayam practices, exhalation is carried out through one nostril (Anulom-vilom) or through both the nostrils by contracting the glottis partially (Ujjayi). Thus, this creates a slight airway resistance. Which regulates the volume of air to be expelled out per unit of time. Thereby, prolonging the exhalation.

These 3 stages are the foundation for pranayam techniques, meditation and cleansing kriyas. Also, this 3 part breath brings awareness to the present moment and calms the mind.

Key principles of practice

The guiding principle behind Pranayama is that we all hold physical or emotional blocks in our bodies which inhibit the flow of breath and of prana – life energy. This can leave us feeling unwell and "stuck" or blocked physically and emotionally. By practising Pranayama (and asana) we are clearing these blocks so breath and prana can flow freely, our bodies can then function properly and our minds can become calmer and clearer.

Pranayama techniques focus on one or more of the four parts of the breath.

1. Inhalation (puraka)
2. Internal retention (antara-khumbaka)
3. Exhalation (rechaka)
4. External retention (bahya-khumbaka)

Practice should be built up gradually starting with simple breath awareness exercises and Ujjayi breathing then Nadi Shodhana (Alternative Nostril Breathing) before moving onto retention of the breath. The aim is not to see how long you can hold your breath for. The breath to be smooth and even and never strained even after breath retention.

Most kinds of Pranayama are practised sitting down with an upright spine for example in Sukhasana / Cross-legged Pose, Virasana / Hero's Pose (on props if needed) or Padmasana / Lotus Pose.

Some Pranayama practices should be avoided by certain groups of people. For example, Nauli Kriya (Abdominal massage) and Kapalabhati Pranayama (Skull Shining Breath) are very strong on the abdominal muscles. While this is a benefit for many people, they are not suitable for pregnant women and women who are menstruating. Any practice which includes breath retention is not recommended for people who have issues with their heart or blood pressure.

The benefits of a regular Pranayama practice

Practising Pranayama regularly helps to improve general health and wellbeing by allowing the breath and prana to flow freely in the body. It can improve mood, sleep, energy levels and digestion.

Different types of Pranayama have specific benefits. For example, some such as Kapalabhati Pranayama (Skull Shining Breath) are energizing and detoxifying with a fast rhythm. They use strong abdominal contractions to expel the breath so they tone the abdominal muscles as well.

Other types of Pranayama are balancing or relaxing like Nadi Shodhana (Alternate Nostril Breathing) or Sama Vritti (Equal Breathing) where inhalations and exhalations are equal length.

8 Types of Pranayama and its Benefits

The 8 types of pranayama and its benefits are as follows:

1. Nadi Sodhana

Nadi Sodhana is done by sitting in a cross legged position comfortably. Then using the right hand, one should close the right side of the nose while inhaling deeply with the left nostril. This procedure must be repeated with the right nostril as well. There are various benefits of Nadi Sodhana if it is practiced daily for 10-15 times. This technique helps in purifying the energy channels of the body. Due to alternate nostril breathing, it brings balance to the mind, body and soul of the human body. This type of technique is said to be innovative and it also helps in stress, anxiety and curb the desire of smoking.

2. Shitali Pranayama

This type of pranayama is done by rolling the tongue in an O shape and inhaling through the mouth. One should hold the breath and practice chin lock (jalandhar bandh), then exhale through nostrils after sometime. This should be repeated until one has reached 8 and 15 cycles. Shitali pranayama is said to be the most refreshing breathing exercise which is effective in cooling down the body. It also helps in reducing anxiety.

3. Ujjayi Pranayama

This type of pranayama is done by breathing through the mouth while sitting in a cross-legged position. One should try to mimic the sound of ocean waves by constricting the throat. Then after closing the mouth, breathing should be done through the nose by again constricting the throat. This procedure should be done 10-15 times. This may feel awkward in the beginning but gives great relaxation .It also helps in throat related issues. It can act as an alternative treatment for stress and PTSD as it helps in reducing anxiety.

4. Kapalabhati Pranayama

This type of pranayama is done by forcefully exhaling from lungs and inhaling is done involuntarily. The exhalation should be so forceful that one should suck the belly by releasing the air. In the same way when inhaling is done, the belly should go back to the same position. Usually kapalabhati pranayama is done for warm up. This cycle of inhalation and exhalation should be done for few minutes. This type of pranayama is quite beneficial in strengthening the diaphragm and abdominal muscles. It also helps in increasing focus, reducing anxiety and burning calories.

5. Bhastrika Pranayama

This type of technique is done by sitting in a cross legged position while keeping the spine straight and closing the eyes. Inhaling and exhaling should be at a fast rate. In this pranayama, one needs to inhale deeply and exhale forcefully in such a way that the stomach goes inside. One needs to remain consistent in this type of breathing technique. This is one of the best pranayama as it helps in increasing the blood circulation in the body and also activates body channels. It also plays an important role with worry, tolerance of anxiety as well as PTSD.

6. Bhramari Pranayama

This type of pranayama is done by closing the ears with the thumbs and eyes with the finger. One should mimic the sound of a bee while inhaling and exhaling slowly. One can also chant 'OM' while exhaling. This is also known as 'humming bee breath'. Once the cycle is completed one should repeat it. This should go on till 5-10 minutes. This humming sound calms the mind and body naturally. It helps in increasing concentration, alertness, memory improvement and relieving stress.

7. Anuloma & Viloma Pranayama

This pranayama is divided into two stages: Paused inhalation and paused exhalation. It is done by inhaling for 2-3 seconds and pausing, then again restarting inhalation and pausing for few seconds while sitting in a comfortable position. Inhalation should be done until lungs are full of air. Exhalation must be done slowly. One must relax the mind and body. This is Viloma Pranayama where pausing of breathing is in regular intervals. In anukoma pranayama, one must breathe nostrils in an alternative way. Both are similar. These techniques help in relaxing, reducing stress and cleansing of nasal passages.

8. Sheetkari Pranayama

This pranayama is done by producing 'sheetkar' sound from the mouth. This technique is done by inhaling air while keeping the tongue behind the teeth. One must do the jalandhar bandh and hold the breath. After that one must exhale the air through nostrils. This pranayama is great when done in summer as it helps to keep the body cooler. In this way it plays an important role in keeping the body temperature under control.

These are the 8 types of pranayamas and its benefits which should be practiced under the guidance of yoga gurus or experienced professionals. These breathing techniques have physical as well as mental benefit. These techniques are useful for yoga purposes as well as for meditative practices. It is quite beneficial in improving cardiovascular health, increasing lung function and capacity, managing blood pressure, reducing stress and anxiety and improving concentration.

PRANAVA MUDRA FOR PRANAYAMA (BODY GESTURES & MENTAL ATTITUDES)

The first two fingers of the right hand palm are to be curved and last two fingers are to be kept straight and to be held together. Now straighten the thumb and bending the right hand in the elbow, place the curved fingers in such a way that they come near the lips. Keep the hand from shoulder to elbow glued to the chest. Keep the right hand thumb on the right side of the nose and last two fingers on the left side of the nose. Now by pressing the thumb, the nasal cavity on the right side can be closed and by pressing the last two fingers left side cavity can be closed. The pressure should be light and on just below the nasal bone, where the fleshy part begins. With this arrangement of the fingers, one can close any of the two nasal cavities. Here only the movement of thumb and the last two fingers is expected.

Movement of other parts should be avoided. The face should be kept quite gay and relaxed in order to practice breathing more effectively. Further, in order to practice the cycle of inhaling and exhaling, six supplementary types are given. In all these types, the speed of breathing is more. These are actually the

types of quick breathing. While practicing these types one should first sit in one of the following Asanas: Padmasana, Vajrasana or Swastikasana. Then, the left hand should be kept in Dhyana Mudra and the right hand in Pranava Mudra. The eyes should be closed and the whole attention should be concentrated on breathing so that it will be possible to acquire it.

Type - 1
Keep both the nostrils open and then inhale and exhale with both the nasal passages. This type is nothing but quick breathing with both the nasal cavities. One should inhale and exhale with as much speed as possible and for as much time as feasible.

Type - 2
Take up Pranava Mudra and close the right nostril with the help of the thumb of the right hand, and inhale with left nostril and also exhale through the same nasal passage. In brief this type can be described as quick breathing with the left nostril.

Type - 3
In this type left nostril is to be closed and the quick breathing is done with the right nostril.

Type - 4
In this type close the right nostril, and inhale with the left nostril, and then immediately close left nostril and exhale with the right nostril. In this way try quick breathing by changing the nostrils.

Type - 5
This type of breathing is just opposite the previous one, that is, the left nostril is closed and inhaling is done with the right nostril, then immediately closing the right nostril, exhaling is done with the left nostril.
Connection Between Yoga & Nature at Yoga Vidya Dham

Type - 6
This type of breathing is designed by combining previous two types i.e., type 4 and type 5. First inhale with left nostril and exhale with right one, then inhale with right nostril and exhale with left nostril. Later continue the same process i.e. inhaling & exhaling with left and right nostrils alternately. Further switch to fast breathing by increasing the speed of breathing. After sufficient practice the speed of breathing can be increased immensely.
Initially one should start with eleven cycles of breathing, and it should be increased to one hundred and twenty one without any fear. However, later the breathing should be made a part of daily practice of other Asanas, and be practiced for two to three minutes. All these types can also be practiced with slow inhalation and exhalation. Here it is important to note that practicing these types of breathing does not mean doing Pranayama. This is simply a preparation of the actual practice of Pranayama.

Some valuable pointers to consider for your daily pranayama practices

1. Place should be ventilated.
2. Mornings and evenings are an ideal time for the pranayama practices.
3. Everyday about 15 minutes of pranayama.
4. Place should be neat and clean free of dirt, pollutants and pollutants.
5. Make it a point to practice every day at same place and time.
6. Place should be distraction proof.
7. Daily pranayama practice should be done on an empty stomach (at least 4 hours after any meal/snack consumption.

Physiological mechanisms behind the effectiveness of Pranayama
The muscles involved in inspiration:
Breathing has not been specifically looked at as a cardiac exercise. However, this is because of a lack of focused study or observation of the physiology involved. Normal, involuntary inspiration is primarily caused by the contraction of the eleven pairs of external intercostal muscles and the diaphragm, which add up to 23 muscles. The sternocleidomastoid (left and right) and the scalene muscles (anterior, middle and posterior scalene) are considered accessory muscles of breathing. They assist in elevating the rib cage. These five muscles get involved depending upon the level of effort put in by the subject during inspiration. Thus, deep inspiration in yogic breathing can involve up to 28 muscles.

The muscles involved in expiration:
Normal expiration is passive, accomplished by the recoil of the thoracic cage and may hardly involve any

muscle contraction. However, conscious, deep expiration is accomplished by the contraction of the eleven pairs of internal intercostal muscles, the eleven pairs of innermost intercostal muscles and the abdominal (rectus abdominus, internal and external obliques and transverse abdominus) muscles. The internal intercostal muscles can add force to the exhalation process by lowering the rib cage. The four abdominal muscles can press the abdominal organs upward into the diaphragm, thus diminishing the volume of the thoracic cavity. These abdominal muscles are the main ones involved, when one performs the quick exhalations in kapala bhati. Kapala bhati is a specific type of breathing suggested in Gheranda Samhita [4], where the exhalation is active and the inhalation is passive, the opposite of normal breathing. Thus, deep, active expiration in pranayama can recruit up to 48 muscles.

Deep breathing is normally activated by the autonomic nervous system during strenuous exercises such as aerobic exercise, climbing a steep mountain or sprinting. This is because the increased muscle activity demands increased oxygen. However, interestingly, it is the brain, rather than the skeletal muscles, which consume more oxygen in general. Even though the adult brain weighs less than 2% of the body weight, it consumes 20% of the oxygen inhaled by the human beings. Since most of our occupations today involve brain work, rather than physical work, it is important to delve deeper into the physiological and control mechanisms of breathing and the role of the latter in ensuring efficient functioning of the brain.

Neural control of the respiratory muscles:

These muscles are controlled by 18 (5 cervical, 12 thoracic and one lumbar) pairs of the total 31 pairs of the spinal nerves! The accessory muscles are controlled by the three pairs of cervical nerves C1 to C3, and the diaphragm is controlled by C3 to C5. The eleven pairs of thoracic nerves T1 to T11 are responsible for the contraction of the 11 pairs each of the external, internal and the innermost intercostal muscles. The abdominal muscles are innervated by the thoracic nerves T6 to T12 and the lumbar nerve L1. The involvement of 36 spinal nerves in breathing clearly shows the importance given to respiration by nature.

Respiratory Sinus Arrhythmia:

Respiratory sinus arrhythmia (RSA) is a physiological phenomenon reflecting respiratory circulatory interactions universally observed among vertebrates. Every time one inhales, the heart rate (HR) goes up. Every time one exhales, the HR goes down. It is thought that nature evolved this mechanism to increase the effectiveness of perfusion during inhalation and save energy expenditure during exhalation. Thus, because of the RSA alone, active, deep respiration constantly exercises the cardiac muscle, alternately increasing and decreasing the HR. Let us not forget that our circulatory system takes the increased Oxygen to each of our 130 Trillion cells in every cardiac cycle! Thus, conscious deep breathing is an amazing cardio respiratory exercise.

Role of oxygen in wound healing:

Wounds need oxygen to heal. Continuous supply of oxygen to the tissue through microcirculation is vital for the healing process and for resistance to infection. One of the biggest factors that can inhibit the body's ability to recover is low oxygen flow to the affected area. Hence, the evaluation of tissue perfusion and oxygenation is important in all types of wounds. The Johns Hopkins hospital uses hyperbaric oxygen (HBO) therapy for wound healing. We normally think of cuts, falls and accidents when we hear the word ‘wound’. However, all surgeries result in wounds that take time to heal. Thus, it is the conjecture of the author that recovery from surgeries may be accelerated by deep breathing.

CONCLUSION

Active, deep pranayamic breathing is a very effective, cardiorespiratory exercise, with a potential to recruit up to 89 muscles,36 spinal nerves and a number of peripheral and central chemoreceptors, volume receptors, besides possibly the adrenal and thyroid glands (in releasing epinephrine and thyroid hormones). Thus, the health of the heart improves, and the heart rate and the blood pressure are bound to reduce with prolonged practice of pranayama. If the recent findings of CSF flow modulation by respiration are confirmed, then regular deep breathing has the potential to provide sufficient supplies and also delay or prevent the accumulation of beta amyloids in the brain, thus preventing Parkinson’s and Alzheimer’s diseases.

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