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PRANAYAM – ESSENTIAL PHYSIOLOGICAL ACTION: A CONCEPTUAL STUDY

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ABSTRACT

Introduction: *Ayurveda* is a monumental contribution of India to the world. It represents a well-developed human care system and speaks of the art and science of health and healing. It is the science the reveals knowledge of life. *Ayurveda* and *yoga* are interconnected holistic science from ancient time. *Ayurveda* believes that *Dosha, Dhatu Mala* are the roots of the body. Among all three *Sharirik dosha Vata dosha* is up most dominant and powerful *dosha* in *ayurveda*. This has been responsible for diseased and healthy state to maintain human physiological action. *Pranayam* is part of yoga science and it's also helpful to maintain and channelization of *vata dosha*. **Objective:** the purpose of the study is to collect and compile *Ayurved* perspective and physiological importance of *pranayam* from various ancient classical *ayurveda* and yoga text. **Data source**: a literary study has been conducted through the various ancient texts of Ayurveda and yoga. Various websites are also referred to in this context. **Review method**: literary research. **Discussion and conclusion**: classical reference can be very well used to understand the relation between pranayam and Ayurveda physiological concept. **Result**: attempt is made to analyze the pranayam as an essential physiological action.

KEYWORD: *Pranyam*, *Yoga*, Physiological action, *Ayurveda*, effect of *Pranyam.*

INTRODUCTION

Ayurveda is a monumental contribution of India to the world. It represents a well developed human care system and speaks of the art and science of health and healing. It is the science the reveals knowledge of life. It defines health and factors responsible for its safeguarding and promotions. It is the science, which does not only start with fundamental understanding but also develops from observations of phenomenon.

Prana is a Sanskrit word means life, which in effect of the "absolute energy". Prana is the power which makes the difference between live and dead objects. It is a unique principle of energy, or '*sanjivini'*- the symbol of life itself. *Ayam* means to prolong pause or to control the path.[1]

Inspiration and expiration takes place at a regulated speed. As per *Yogashastra*, *Pranayam* means control of breathing regulation of inhalation, pause and exhalation this are constitute of *Pranayam*.[2] These three functions when followed regularly are known as *Pranayam*. By its action it controls *Prana* and increases the body's internal metabolism and removed the waste or poisonous substances from the body that makes healthy and strong body.

According to one of the Modern thinker and critics Mr. David frawley[3], *Prana* means the vital force and ayama means expansion. So, *Pranayam* means expansion of the "vital force". However some people define pranayam as retention of the breath. While retention of the breath it done correctly, is probably the most power method to expand the vital force and if it doesn't attempt properly then it aggravate many disease just as falling of breath causes us to faint. To achieve good results from *Pranayam*, proper guidance is required. Through *Pranayam* one slows down and extends the breath so that the inner prana or higher life force can manifest. This aids in slowing down and calming the mind, facilitating medication.

Hence in this study, here we are trying to collect and compile the *Ayurveda* perspective and physiological important of *Pranayam* as a conceptual study.

AIMS AND OBJECTIVE

The purpose of the study is to collect and compile the *Ayurveda* perspective and physiological important of *Pranayam* from various ancient classical *Ayurveda* and Yoga texts.

MATERIAL AND METHOD

The literary study has been conducted through various ancient texts of *Ayurveda* and *Yoga.* Various website are also referred in this context.

DISCUSSION

Maharishi Patanjali, in his *Ashtanga yoga*[4], has given more importance to *pranayama* than asana for good health. *Pranayam* is an integral part of Ayurvedic treatment methods and lifestyle regimens. Various Yoga breathing practices described in classical text of *hathayoga*[5] are enlisted in below table.

Table No. 1: Procedures of various Yogic breathing Practices.

S.No	Name of the Practice	Method of Practice
1	Kapalbhati	• Sitting with back and neck erect. • One should inhale with both nostrils and exhale rapidly by flapping abdomen during each exhalation at a peace of 60-120 breaths/min
2	Bastrika (Bellow's breath)	• One should inhale and exhale quickly and forcefully without straining by flapping the abdomen. • These should be practiced for up to 100 breaths.
3	Nadishodhan/Nadishuddhi (Alternate Nostril breathing)	• With the right thumb, close the right nostril and inhale through left nostril. • Closing the left nostril, exhale through right, following which inhalation should be inhalation should be done through right nostril. • Closing the right nostril breath out through left nostril. • This is one round. The procedure is repeated for desired number of rounds.
4	Suryanuloma-Viloma (Right uni-nostril breathing)	• Closing the left nostril, both inhalation and exhalations should be done through right nostril, without altering the normal pace of breathing.
5	Chandranuloma Viloma (Left uni-nostril breathing)	• Procedure similar to Suryanuloma Viloma, breathing is done through left nostril alone by closing the right nostril.
6	Suryabhedana (Right nostril initiated breathing)	• Closing the left nostril inhalation should be done through right nostril. • At the end of inhalation, close the right nostril and exhale through left nostril. • This is one round. The procedure is repeated for desired number of rounds.
7	Ujjayi (Psychic breath)	• Inhalation and exhalation are done through the nose at normal pace, with partial contraction od glottis, which procedure light snoring sound.

		• One should be aware of the passage of breath through the throat during the practice.
8	Bhramari (Female Honeybee humming breath)	• After a full inhalation, closing the ear using the index fingers one should exhale making a soft humming sound similar to that of a female honeybee.

Pranayam is most effective in treating diseases of the respiratory, circulatory and nervous systems whose function depends upon the right flow of *Prana*, yet it is excellent for all condition of debility, low energy, chronic fatigue, and weak immunity and convalescence. It is probably the most important single action that can improve our health. Life without Pranayam is life without real *Prana*.

Pranayam not only exercise of the Lungs but all the organs in the body through the internal massage by the action of inhalation and exhalation. This massaging action improves circulation to the organs and dispels toxins bringing the *dosha* to the digestive tract for elimination. It sets up deep and powerful organic rhythm to sustain not only health and strength but also calmness of mind.

Pranayam is also an important tool for treating psychological and emotional disorders. It is excellent to counter depression, releases grief and attachment and reduce stress and tension. It is much more effective in raising our spirits than any stimulant or drug.

Practice of *Pranayam* correctly requires below mentioned three things that are**:-**

1) Selection of proper place and time.
2) Proper asana
3) Proper procedure

1) Selection of proper place and time

- A pure lonely place has to be chosen, which has a silent atmosphere, the floor must be smeared with the cow dung. The floor neither elevated nor too law. A deer skin or durva grass should be on the floor. The correct time for *Pranayam* is Brahma muhurta.

2) Proper Asana

- Seating in sukhasana or Padmasan is proper asana for *Pranayam*.

3) Proper Procedure

- Mainly three procedure have to be considered while practicing *Pranayam*. That is:

a) *Puraka* (inhalation) b) *Kumbhaka* (retention) and c) *Rechaka* (exhalation).

A) *Puraka*

- Seating in *Padmasana* or *Sukhasana* the person should close the right nostril with the right thumb and air should be taken in through the left nostril. Take slow and deep breath up to the extent to which it is possible for the lungs.

Factor to be considered

1. Breathing should be deep and complete.
2. At the end of *Puraka* lungs should filled completely and there should be expansion of all parts of the lungs.
3. It is a slow act, there will be no extra force applied for taking.
4. Flow of the air should be uniform from the beginning to the end of *Puraka*.

- The time taken by each *Puraka* in successive rounds of a sitting should be same. Thus *Puraka* is not just any form of inhalation but it is the controlled process of inhalation or fulfilling the above on junction.

B) *Kumbhaka*

- Try to retain the inhaled air after closing the throat by pressing it with tongue, closing both nostrils with ring finger and right thumb. In *Kumbhaka* there is no question of speed movement and uniformity of depth of breath.
- It involves stopping all movements of breath by holding all respiratory apparatus tight and still.

C) *Rechaka*

- It is not exhalation; it means a controlled exhalation which slow, deep, uniform, completed in equal time in each round. There is fixed proportion of time to be maintained in respect to *Puraka*, *Kumbhaka* and *Rechaka*.
- It is recommended that *Rechaka* should take double the time than *Puraka*. In *Puraka* there is a muscular effort for expending the lungs. *Rechaka* is comparatively a passive act helped by the elasticity of the lungs which causes than to shrink.

Benefits of *Pranayam*

प्राणायामादियुक्तेन सर्वरोगक्षयो भवेत्।

अयुक्ताभ्यासंयोगेन सर्वरोगसमुद्भवः ||

(हठयोग प्रदीपिका २.१६)

If *Pranayam* done properly, eradicates all diseases but improper practice of *Pranayam* will lead to many diseases.

1. It increases the capacity of the lungs.
2. Being a breathing exercise, it trains individual to do strenuous muscular effort in conditions of emergency.
3. It improves memory power.
4. It enhances life span.

- **Working on *Prana***

There are many ways to work on *Prana*, proper nutrition increases *Prana* on a physical level. This also requires proper elimination. According to *Ayurveda* the *Prana* from food is absorbed in the large intestine. *Apana vayu*, which resides in this organ, is the most important *Prana* for physical health, insuring that no toxins can build up in the body. It also helps for proper abortion of drugs and nutrients of the food, helping the physical body to cut off the root of physical disease.

- **Role of *Pranayam* on *Jatharagni***

Pranayam develops *jatharagni*, which is responsible for digestion of food in the body; *jatharagni* develops primarily through correct retention of the breath that follows deep inhalation. Inhaled oxygen is food for *Pranagni*; exhaled carbon dioxide is its waste materials. Just as fasting purifies the physical body, so breathe retention purifies the subtle body. *Pranagni* creates a special form of sweating that eliminates the toxins that block the various channels. It makes the body clean and disease free.

- ***Pranayam* and *Dosha***

- *Pranayam* maintains the homeostasis of the *dosha*. The right practice of the *Pranayam* normalizes *vata*, the master *dosha* and expression of *Prana*. *Pranayam* is one of the main practices for reducing *Kapha*, which has a tendency to stagnation and the production of mucus. It helps to reduce *Kapha* in both head and lungs. In addition, special *Shitali* and *Shitakari* (Cooling) *pranayams* counter *Pitta* and remove heat.

- Inhalation, like eating, relates to *Kapha* and has a building effect. Retention, like digestion, relates to *Pitta* and has a transforming effect. Exhalation, like elimination relates to *Vata* and has a reducing or depleting effect. The left–right predominance of breath has its *doshic* action.
- Right nostril breathing energizes the "*Pingala*" or solar nadi that increases *Pitta* or fire. Left nostril breathing energizes the "*Ida*" or lunar nadi that increases, *Kapha* or water. Balanced right and left nostril breathing strengthens the *Vata dosha*.
- Breathing through the mouth increases *Kapha* by its cooling nature. However mouth breathing mainly tends to increase waste *Kapha* or mucus. For this reason it is generally not recommended, although a few special *yogic Pranayam* do employ it. It can keep the Prana in the central channels or "*sushumana*" or in the "*saraswati*" *nadi*, the channels of the mouth and throat, and works on *Udana vayu*, aiding in upward movement of *Prana*.

- **The five Pranic breath**

Table 2: Function of *Prana Vata.*

Types of *vata*	Functions	Anatomical relation with nervous system[6]	Physiological functions[7]
Prana vata[8]	1. ***Buddhi dharana*** a) *mano buddhi (tattva gnana, dharana, grhana), indriya buddhi (*sensory knowledge). b) *smriti* (memory), *anubhava* (knowledge through direct perception, inference, analogy, verbal testimony)	PFA (pre frontal area) Hippocampus, cerebral cortex, Wernicke's area, physical cortex, anterior thalamic group	site of working memory helps in complex intellectual activities like judgment, decision making. Helpful in retention and recollection of recent and past experiences.
	2. *Chitta dharana*: holds functions of *mana* (*indriabhigraha*- initiates and withdraws *indriyas* (*gnana*-intellectual, *karma*-motor) from perceiving their objectives and sends information to *atma* (intellectual, motor, emotional). *swasya nigraha* (self-control)	Heschl's gyrus, post central gyrus, insural cortex, pre pyriform cortex, amygdala, cerebellum, hypothalamus dorsomedial aspect of thalamus associating with prefrontal gyrus, primary motor area, pre motor area, basal ganglion.	Intellectual, emotional, motor activities
	3. *Hridaya dharana*: holds functions of *hridaya* (heart)	Neurons lie in dorsal motor nucleus of the vagus nerve in reticular formation of medulla, caudal hypothalamus, vasomotor centre in medulla	Cardio inhibitory
	4. *Swasa*	Respiratory centers located	-

	(respiration)	in the reticular formation of brain stem, dorsal group of respiratory neurons of medulla, pneumotaxic centre and apneustic centre of pons	
	5. *Anna pravesana* (mastication, salivation, deglutition)	Nuclei of trigeminal, facial, glosso-pharyngeal, vagus, hypoglossal, located in pons, medulla, other parts of brain.	Salivation and deglutition, chewing.
	6. *Kshavadhu* (sneezing)	Sneezing centre of CNS stimulated by impulses through trigeminal nerve from nasal mucosa.	Sneezing
	7. *Nishteeva* (spitting)	Nucleus of facial nerve located in caudal portion of pons.	Spitting
	8. *Udgara* (belching)	Medulla (a poly synaptic visceral reflex)	Holding of breath, contraction of diaphragm and abdominal muscles, relaxation of sphincters, initiation of reverse peristalsis.

Table 3: Function of *Udan Vata.*

Types of *vata*	Functions	Anatomical relation with nervous system	Physiological functions
Udana vata[9]	1. ***Vakpravritti***- (speech), 2. ***Prayatna*** (motivation), 3. ***Urja***, 4. ***Balakara,*** 5. ***Varnakara,*** ***6.Smritikaraka*** (sensory adaptation)	Motor fibers of the cranial nerves- facial, gloss pharyngeal, vagus, and accessory, hypoglossal as a whole can be compared to cervical plexus as it is formed by these along with nerves arising from vertebrae C 1-C4	Speech, swallowing, respiration etc. All other functions can be included in it as speech is an integrated outcome of motivation, emotion, sensory adaptation in terms of performance of an individual.

Table 4: Function of *Vyan Vata.*

Types of *vata*	Functions	Anatomical relation with nervous system	Physiological functions
Vyana vata[10]	1. ***Gati*** – voluntary movements of muscles, *Prasarana* (extension), *akunchana / akshepana* (flexion/ withdrawal), *vinamana* (bending), *unnamana* (upward movement) *tiryaggamana* (lateral movement)	CNS	All these movements are nothing but the functions of motor neurons regulated by the CNS based on the sensory information received.
	2. ***Rasa samvahana*** (circulation of	Motor nerve supply to	The circulation is effected by

	rasa) -circulation of *rasa* along with other *dhatus* like *rakta* (according to Gayadasa) to nourish all the *dhatus*.	the cardiac muscle.	the force of regular contractions of cardiac muscles
	3. ***Sweda asrik sravana*** (effecting the outflow of blood and sweat) – this depends on effective contraction of heart and calibre of vasculature.	Thoraco lumbar sympathetic division and Vasomotor centre of ANS and parasympathetic divisions in turn are regulated by CNS. Hypothalamus	Simultaneous and continuous functioning of the muscles of heart and vasculature. Sweat production is stimulated when hypothalamus is triggered due to the heat produced as a result of increased blood flow to the musculature in conditions like exercise, fight etc.
	4. ***Yonow sukra pratipadana*** (deposition of semen inside the vaginal cavity) - here only the act of intercourse can be considered as the actual ejection of semen is the function of *Apana vata*.	Sympathetic flow arising from inferior horn cells of the spinal cord regulated by the CNS.	Movement of the skeletal muscles
	5. ***Sroto vishodhana*** (clearing the channels)	Sympathetic division and Vasomotor centre of ANS	Increased circulation to muscle helps in better supply of oxygen and removes the waste products.

Table 5: Function of *Samana Vata.*

Types of *vata*	Functions	Anatomical relation with nervous system	Physiological functions
***Samana vata*[11]**	1. ***Annam grihnati*** (receiving and withholding it in *annavaha srotas*)	Vagal, glosso pharyngeal supply of the GIT (gastro intestinal tract), ENT (enteric nervous system)	Vagal, glosso pharyngeal reflexes facilitate the entry of the food into stomach through oesophagus and storage of food is monitored by duodenal gastric reflex of vagus and by prevention of the reverse peristalsis by ENS
	2. ***Annam Pachati*** (helps in proper digestion by regulating production of digestive juices, movement of parts of digestive system for proper mixing and transferring the contents to next stage of digestion.	Sympathetic, para sympathetic supply of glands of digestive system, myo-enteric plexus.	Secretion of the digestive juices through vago- vagal reflex, sympathetic stimulation. Movement of digested food into duodenum, towards iliocaecal valve for absorption is initiated by the myo enteric plexus.
	3. ***Annam Vivechayati*** (discrimination of essence and waste products of digested food by the absorption of essence,	Myo- enteric plexus, vagus nerve innervation	The retention of chyme in ileum for more absorption is facilitated by relaxation of ilio-caecal sphincter by vagus stimulation initiated by gastrin feedback.

	water etc and forming solid wastes)		Absorption of water, electrolytes in colon is by Haustrations controlled by myo enteric plexus.
	4. ***Munchati*** (passing away the contents)	Parasympathetic innervation of colon, myo- enteric plexus	The movement of the remnants from colon to rectum and anus is by gastro colic, duodeno colic reflexes transmitted by myo-enteric plexus by initiation of Para sympathetic nerves stimulated by over distension of colon.

Table 6: Function of *Apana Vata.*

Type of *vata*	Functions	Anatomical relation with nervous system	Physiological function
Apana vata[12]	1. ***Mutra nishkramana*** (emptying of bladder) the urine formed by *Samana vata* is excreted out by the coordinative function of the *Apana-Prana-Vyana vata*s.	sensory fibres of the pelvic nerves, motor branches of the pudendal nerve (Central control is by the centres in cortical, pontine, spinal regions which can be considered as indriya dharana of prana).	Micturition reflex is through sensory fibres of pelvis, pudendal nerve, voluntary control of micturition is by sacral reflex
	2. ***Sakrit nishkramana*** (bowel evacuation / defecation) A process of evacuation of solid wastes from guda by coordinative function of the *Apana-Prana-Vyana vata*s.	Pudendal nerve, nervi erigentes which inturn are under the control of CNS.	The process of defecation is through Mass peristalsis, intrinsic reflex, defecation reflex
	3. ***Sukra nishkramana*** (Ejection of semen) the movement of sukra from vrishana to sishnendriya and its ejection.	Parasympathetic supply, nervi erigentes, sympathetic supply in L1-L2 level, pudendal nerve	CNS analyses Sensory, psychic stimulus, initiates parasympathetic supply through nervi erigentes results in erection, simultaneously initiates sympathetic supply in L1-L2 level resulting in contraction of epididymis, vas deference, seminal vesicles, and prostate causing expulsion of semen into the urethra, urethra then elicits signals to pudendal nerve which inhibits micturition and facilitates ejaculation by rhythmic contraction.
	4. ***Artava***	HPO axis	Ovulation and menstruation both

	nishkramana **(**menstrual flow) artava is described both as menstrual blood and ovum, hence here menstruation, ovulation both can be considered under this heading.		are due to the interplay of hormones through HPO axis
	5. ***Garbha nishkramana*** **(**bearing down the foetus during labour)	Nerve supply to the muscles of uterus and abdomen, hypothalamus	The expulsion of the foetus is by coordinative rhythmic contractions of uterine and abdominal muscles explained by optimal distension theory and ferguson reflex mechanism (weak uterine contractions of uterus caused due to over stretching of cervix- neurogenic reflex to hypothalamus- oxytocin- intensifies the contractions- neurogenic reflex to hypothalamus- oxytocin production-, it is a positive feedback mechanism which continues till the delivery of the baby.

1) Work on *Prana* or energizing breath

- The *pranic* breath is breath in the head. It is energized through deep inhalation, drawing energy above in to the higher brain centers centered in the third eye.
- The *prana* breath is useful for treating all disease of the mind, senses, head, brain and nervous system. It is particularly good for sinus allergies and headaches. It aids in nervous exhaustion and brain fatigue. It provides a pranic bath to the brain, refreshing and revitalizing it for more productive mental activity.

2) Work with *Udana* or Ascending breath

- The *Udan* breath is the breath in the mouth. It is allied with thought, sound or *mantra* and the upward movement of the will. The *Udana* breathe treats all diseases of the throat region and vocal cords. It guards against sore throat, improves the voice, gives vitality and provides more strength. It helps anyone who needs greater power of articulation and self expression.

3) Working with the *Vyana* or expanding breath

- The *Vyana* breath is the breath in the heart that pervades the entire body and extends outward. *Vyana* breathing aims at opening the lungs and heart region and from there expanding out to the rest of the body, the external world and the whole of life.
- The *Vyan* breath treats all diseases of circulatory and musculoskeletal system. It is good for lungs problems, heart disease, arthritis, asthma and stress. It helps all those who need greater energy and co-ordination for physical excretion and movements.

4) Working with *samana* or centering breath

- The *samana* breath is the breath in the "Naval" or belly. *Samana* breathing aims at centering and balancing our energy.
- The *samana* breath treats all disease of digestive system, liver, gall bladder, stomach and small intestine. It is particularly good for low appetite, poor absorption and ulcers. It is aids in the homeostasis, balance metabolism and has a balancing affect on both body and mind.

5) Working with the *Apana* or the descending breath[13]

- The *Apana* breath is the breath in the root *chakra* that connects us with the earth.
- The *Apana* breath treats all diseases of the reproductive, urinary and excretory systems. It is good for constipation, diarrhea, menstrual problems and sexual debility. It strengthens the immune system, supports *Ojas* and aids in the prevention of the disease.

CONCLUSION

In *Pranayam*, *Pran* is symbolic state of absolute energy while in *Ayurveda Vata dosha* is also known as source of energy. Each and every physiological action generates and regulate by *Vata dosha*. Like *Vata Dosha*, *Pranayam* also responsible for ignited *jatharagni* and maintains the homeostasis of *dosha*. By this one can say that right practice of *Pranayam* normalize *Vata*, the master *dosha* and expression of *Prana*.

Abstract- Introduction- आयुर्वेद विश्व को भारत का एक महत्वपूर्ण योगदान है। यह एक अच्छी तरह से विकसित मानव देखभाल प्रणाली का प्रतिनिधित्व करता है और स्वास्थ्य और उपचार की कला और विज्ञान की बात करता है। यह जीवन के ज्ञान को प्रकट करने वाला विज्ञान है। आयुर्वेद और योग प्राचीन काल से परस्पर जुड़े हुए समग्र विज्ञान हैं। आयुर्वेद का मानना है कि दोष, धातु मल शरीर

की जड़ें हैं। आयुर्वेद में तीनों शारिक दोषों में वात दोष सबसे प्रमुख और शक्तिशाली दोष है। यह मानव शारीरिक क्रिया को बनाए रखने के लिए रोगग्रस्त और स्वस्थ अवस्था के लिए जिम्मेदार रहा है। प्राणायाम योग विज्ञान का हिस्सा है और यह वात दोष को बनाए रखने और चैनलाइज़ करने में भी सहायक है। **Objective**: अध्ययन का उद्देश्य विभिन्न प्राचीन शास्त्रीय आयुर्वेद और योग पाठ से आयुर्वेद परिप्रेक्ष्य और प्राणायाम के शारीरिक महत्व को एकत्रित और संकलित करना है। **Data source**:: आयुर्वेद और योग के विभिन्न प्राचीन ग्रंथों के माध्यम से एक साहित्यिक अध्ययन किया गया है। इस संदर्भ में विभिन्न वेबसाइटों का भी उल्लेख किया जाता है। **Review method**:: साहित्यिक अनुसंधान। **Discussion and conclusion**:: प्राणायाम और आयुर्वेद शारीरिक अवधारणा के बीच संबंध को समझने के लिए शास्त्रीय संदर्भ का बहुत अच्छा उपयोग किया जा सकता है। **Result**:: प्राणायाम को एक आवश्यक शारीरिक क्रिया के रूप में विश्लेषण करने का प्रयास किया जाता है।

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