WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 8.084
Volume 10, Issue 14, 1435-1443. Review Article ISSN 2277– 7105

ANATOMICAL EXPLORATION ON VARIOUS POSTURES OF *"SURYANAMASKARA"*

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Article Received on
19 October 2021,

Revised on 09 Nov. 2021,
Accepted on 29 Nov. 2021

DOI: 10.20959/wjpr202114- 22422

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ABSTRACT

In ancient time, sages used to do fasting, *Yogasanas*, chanting *Mantras* and various other activities, for the maintainance of the longevity of life. Alongwith *Ayurveda, Yoga* is the oldest and most scientific science for the maintenance of life. It involves not only the physical cure but also cares for the psychological system of body. *Surya Namaskara* is also a very useful *Yoga* practice. *Yoga* practices were initiated by the esteemed sages who knew that these practices maintain health and lead to greater social creativity and productivity. In recent years, more and more people are turning towards *Yoga* as a source for exploring and improving their inner lives. Anatomy is closely co-related to *Suryanamaskara* as it stimulates major muscles of body such as pectoralis major, biceps brachii, deltoid, triceps brachii, rectus abdominis, quadriceps femoris, gastrocnemius etc. This stimulation increases vascularization in the body and transmits enormous energy in the human beings.

KEYWORDS: *Suryanamskara*, *Yogasanas*, Nor-epinephrine, *Chakras.*

INTRODUCTION

In todays era, impact of sedentry lifestyle has become a reason to change the over all constitution of one's healthy physique. Poor food habits, ill-physical excercise, stressful work leads to psycho-physiological disturbances in human beings. In ancient time, sages used to do fasting, *Yogasanas*, chanting *Mantras* and various other activities, for the maintenance and longevity of life.[1] Alongwith *Ayurveda Yoga* is also an oldest and most scientific health science for the maintenance of life. It involves not only the physical cure but also cares for

the psychological wellness of body. Learning of *Yoga* postures is not an easy process, it needs time and discipline. *Yoga* directly connects the human being with nature. It helps to liberate us from our limited notion to who we are, because every human has different strength and weakness according to the constitution of his body. Therefore, the ancient sages of *Yoga* have designed various *Yoga* excercises or *Asanas*, so that these can be helpful to each and every person to adjudge and introspect himself.[2,3]

Asanas mentioned in the classical *Yogic* texts have specific anatomical and physiological effect on the body.[4]

The definition of *Asana* is "*Sthiram Sukham Asanam*"[5] which means well synchronized and pleasant position of body. *Asanas* are the "skillful exercises" that give physical and mental power and tone the body-mind for further wellness.[6] *Asana* helps to synchronize the mind withbody. We all follow a certain set of medications and exercises to protect our mind as well as the body parts.[7]

The word *Asana* means "Seat". It also refers to the normal positioning of body. *Yogasana* helps in protecting the inner organs of the body and there by to maintain the body fit and fine. The motto of doing the *Asana* is to keep the organs fit and there by controlling the mind. *Asana*s are the physical efforts of *Yoga* methods. The ill managed physical exercises bring unwanted side effects to the body. But well managed *Yogasana*s give the strength to the inner and the outer parts of the body and protect the mind as well.[8]

AIMS AND OBJECTIVES

1. To know about the involvement of anatomical structures in 12 postures of *Suryanamaskara*.
2. To know the facts about supereme *Yogic* science behind *Suryanamskara*.

MATERIAL AND METHODS

This study is purely a literary study in which material is collected from the classical texts of *Yoga* and *Ayurveda*, Modern books of anatomy, peer journal reviews and internet etc.

Review of Literature

Yogic Asanas are not only the postures which are performed physically but they closely resemble with the nature. We see that in *Ayurveda* human being is typicaly correlated with universe (यत्पिण्डे तत् ब्रह्माण्डे) Similarly *Yogic Asanas* are also named on behalf of the

things available in nature which verifies *Loka-Purusha Samya Siddhanta*. For example *Vrikshasana* resembels to the posture of tree, *Mayurasana* is a posture which looks like peacock where as *Dhanurasana* looks like a bow etc.

All these examples state that *Yoga* is not just a posture which is mentioned in texts but is a science which connects the human beings to nature.

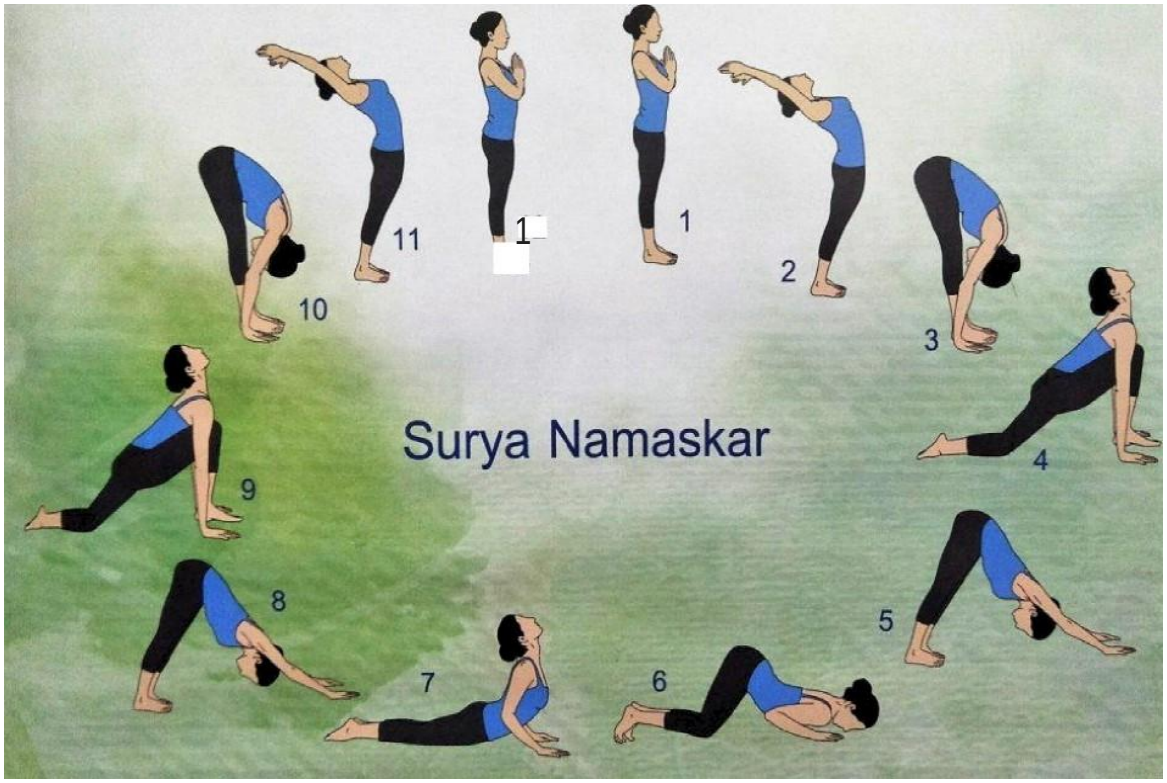
Suryanamaskara is a very important *Yogic* exercise. Infact, it is a group of twelve *Yoga Asanas. Surya* means "Sun" and *Namaskara* means "Salutation".[9] Ancient but simpler sun salutations such as *Aditya Hridayam* hymn which was recited by Sage *Agastya* for lord *Rama* on the battle field before fighting with *Ravana* when *Shri Rama* was preplexed while fighting with *Ravana*. The 3 chants of that mystical *Suryanamskara* empowered *Shri Rama* to defeat Ravana in the battle. This hymn is mentioned in *Valmiki Ramayana*, "*Yuddha Kaanda*" Canto 107. The origin of ***Suryanamaskara*** is vague. Indian tradition connects the 17th century saint *Samartha Ramdasa* with *Suryanamaskara.* But there it is not defined that what movements are involved in the *Suryanamaskara*. In 1920s, *Bhawanrao Shriniwasrao Pant Pratinidhi*, the *Rajah* of *Avadha*, popularized and named this exercise describing it in his 1928 book The Ten-Point Way to Health*: Suryanamaskara*.[10] In ancient times, the sun was worshipped as a daily ritual because it has a powerful connection with spiritual consciousness. Worship of the outer and inner sun was a religio-social ritual which attempted to placate those forces of nature beyond man's control. This practice of worship was initiated by distinguished sages who knew that these practices maintain health and lead to greater social creativity and productivity. Its versatility and application makes it one of the most useful method to induce a healthy, vigorous, active life and at the same time, prepares for spiritual awakening and the resultant expansion of awareness. In recent years, more and more people are turning towards *Yoga* as a source for exploring and improving their inner lives. Though the need for techniques to enhance physical, mental and spiritual evolution has been recognized, the sedentary style of modern living makes it difficult for even the most determined individual to implement *Yoga* practice. *Suryanamaskara* is almost a composite group of exercises as well as *Saadhana* in itself, containing *Asana, Pranayama* and meditational techniques.[11]

Yoga comprises of three basic components[12]:
Stage 1- Physical Components Stage 2 - Mental Components Stage 3 - Spiritual Components
Today's lifestyle accentuates mental stress, worries and seemingly insoluble problems at

many levels. *Yoga* practises are an ideal antidote to these problems which prove to be a powerful therapy for mental and physical diseases.

'Suryanamaskara' alone is an integral part of the *Yogic* approach to these problems and can easily be integrated into our daily lives as it requires only five to fifteen minutes of practice daily to obtain remarkable results. It is therefore ideal for all the individuals. As we begin to study and perform this series of *Asanas* along with *Pranayama*, *Chakras* awareness and *Mantra* repetition, we find that it is a group of different *Yogasanas* to complete one exercise of *Suryanamaskara*.

Suryanamaskara holds an important place in *Yoga* Science. It is a collabration of 12 important *Yogasanas* which covers benefits of all the *Yogasanas*. *Suryanamaskara* is supposed to be best when it is done in early morning with an empty stomach. Each round of *Suryanamaskara* incorporates these multiple *Yogasanas* in the format of a cycle where these *Asanas* are repeated in an moving ahead from the start of exercise and then move back to end of the exercise manner.



S. N.	*Asanas*	*Mantra*	Vibration	Breath	*Chakra*	Benefits
1.	*Pranamasana* (Prayer posture)	ॐ मित्राय नम:		Exhale	*Anahata*	Induces a sense of calmness and introspection
2.	*Hasta Uttanasana* (Raised arms posture)	ॐ रवये नमः		Inhale	*Vishuddha*	Stretches the chest & abdomen and lifts Prana to upper parts of the body
3.	*Padahastasana* (Forward bending posture)	ॐ सूर्याय नम:		Exhale	*Muladhara*	Stretches hamstrings, increases blood flow to the brain, Prana chanelled to lower regions of the body, Stretches internal organs.
4.	*Ashwasanchalanasana* (Equestrian posture)	ॐ भानवे नम:		Inhale	*Agya*	Improves hip flexibility, Stretches psoas and groin muscles.
5.	*Parvatasana* (Mountain posture)	ॐ खगायनम:		Exhale	*Vishuddha*	Strengthens core abdominal muscles, arms & wrists, upper back and neck.
6.	*Ashtanga Namaskara* (Eight-limbed posture)	ॐ पूष्ने नम:		Retain	*Svadhisthana*	Strengthens the chest and the arms, increases blood flow to these areas.
7.	*Bhujangasana* (Cobra posture)	ॐ हिरण्यगर्भाय नम:		Inhale	*Muladhara*	Relieves tension in the lower back, dynamic expansion to the internal organs of the abdomen & chest.
8.	*Parvatasana* (Mountain posture)	ॐ मरीचये नम:		Exhale	*Vishuddha*	Strengthens nerves & muscles of the arms & legs, stretches the calf muscles and Achilles tendons.
9.	*Ashwasanchalanasana* (Equestrian posture)	ॐ आदित्याय नमः		Inhale	*Agya*	Improves hip flexibility, stretches psoas and groin muscles.
10.	*Padahastasana* (Forward bending posture)	ॐ सावित्रे नम:		Exhale	*Muladhara*	Stretches hamstrings, increases blood flow to the brain, Prana chanelled to lower regions of the body, Stretches internal organs.
11.	*Hasta Uttanasana* (Raised arms posture)	ॐ अर्काय नम:		Inhale	*Vishuddha*	Stretches the chest & abdomen and lifts Prana to the upper parts of the body.
12.	*Pranamasana* (Prayer posture)	ॐ भास्कराय नम:		Full breath	*Anahata*	Induces a sense of calmness and introspection.

Anatomical co-relation of postures of *Suryanamaskara*[13]

Suryanamaskara contains 12 *Yogic* postures in which whole body is stratched and major muscles of body are stimulated. This enhances the range of motion, vascularity, metabolism and removes the toxins. Following muscles are principally active during *Yogic* postures of *Suryanamaskara.*

Muscle	Nerve supply	Action
Pectoralis major	Medial pectoral nerve and lateral pectoral nerve	Flexes, adducts and internally rotates the humerus
Deltoid anterior fibers	Axillary nerve	Flexes, abducts, medially rotates, and horizontally flexes the arm at the shoulder joint
Deltoid posterior fibers	Axillary nerve	Extends, abducts, laterally rotates, and horizontally extends the arm at the shoulder joint
Biceps brachii	Musculocutaneous nerve	Flexes the elbow and supinates the forearm
Triceps brachi	Radial nerve	Extends forearm, adducts arm, extends shoulder
Upper trapezius fibers	Accessory nerve (motor) cervical spinal nerves (motor and sensation)	Elevates and upwardly rotates the scapula and extends the neck
Middle trapezius fibers	Accessory nerve (motor), cervical spinal nerves(motor and sensation)	Adducts (retracts) the scapula
Rectus abdominus	Thoraco-abdominal nerves	Flexes the trunk (flexion of thoracic and lumber spine)
Erector spinae	Lateral branches of the posterior rami of the cervical, thoracic and lumbar spinal nerves	Straightens the back and provides side-to-side rotation
Rectus femoris	Femoral nerve	Extends the Knee, Flexes hip
Vastus medialis	Femoral nerve	Extends knee
Biceps femoris	Terminal branches of the sciatic nerve	Flexes the leg
Gastrocnemius lateralis	Tibial nerve	Talo-crural joint: Plantar flexes the foot Knee joint: Flexes the leg
Tibialis anterior	Deep peroneal nerve also called the deep fibular nerve	Dorsiflexes and inverts the foot

Effect of *Suryanamaskara* on Body's Musculature

- ✓ For the *upper body*, the upper trapezius muscle shows high activation patterns in *Parvatasana* (Mountain posture).
- ✓ Biceps brachii muscle is most active during *Parvatasana (Mountain posture)* and *Bhujangasana* (Cobra posture).
- ✓ Triceps brachii is most employed during *Parvatasana* and somehow for *Bhujangasana* (Cobra posture) also.
- ✓ *Erector spinae* muscles show greater activation during *Bhujangasana* (Cobra posture) as compared to *Parvatasana (Mountain posture), Padahastasana* (Forward bending posture) and *Pranamasana* (Prayer posture).

- ✓ Muscles of the *lower body* also respond in an expected way. Activity of Rectus femoris is greatest during *Parvatasana (Mountain posture)*, as compared to *Padahastasana* (Forward bending posture) and elevated during *Bhujangasana* (Cobra posture).
- ✓ Biceps femoris on the other hand, shows higher patterns of activation during *Parvatasana (Mountain posture)*, *Bhujangasana* (Cobra posture) as compared to *Padahastasana* (Forward bending posture)
- ✓ Tibialis anterior is most engaged during *Padahastasana* (forward bending posture), *Parvatasana (Mountain posture)* as compared to the more passive *Pranamasana* (Prayer posture).
- ✓ There are some evidences that the skilled *Yoga* practitioners have expert and skillful implications of muscle recruitment and intensity of activation. In general, instructors are supposed to have higher levels of muscle activation compared to novices. This is evaluated by the body awareness, proprioception and postural refinement which evolves with practice.
- ✓ A skilled *Yoga* practitioner holds remarkably higher activation of the Anterior deltoid muscles during *Padahastasana* (Forward bending posture) rather than pectoral muscle.
- ✓ Vastus Medialis is a critical knee stabilizer and is of great importance in maintaining balanced force distribution between the upper and lower body during *Parvatasana (Mountain posture)* and *Bhujangasana* (Cobra posture).

CONCLUSIONS

Fundamentally *Yoga* and *Ayurveda* have a great similarity. The line of treatment and the measurements may be different but the diagnostic tools as well as the therapeutic is same. The life style disorders are hampering our society day by day due to our indisciplined life style, heavy workload and lack of exercise. The modern medicine having lot of side effects supports the campaign that the combined therapy of ***Ayurveda*** and ***Yoga*** must be used as an alternative. But we suppose that these should be the main stream treatment systems for life style related disorders due to their safety and secure effects. In the present literary study we tried to enlighten the anatomical and physiological facts about Suryanamskara which shows a great impact on all the muscles. It ignites a significant stimulation in neuro-muscular junction which initiates release of different hormones. This neuro-muscular excitability improves the blood supply and excretes the toxic metabolites from the body. A significant relationship between plasma norepinephrine concentration and neuro-muscular stimulation has been found in various studies during arm cycling and static handgrip exercises under normoxic

conditions. Excitation of these hormones also increases the blood-muscle pump and venous return of body.[14,15,16,17] Thus we can conclude that *Suryanamaskara* is a group of mild and dynamic exercises which mark a befitting effect in the body. It improves metabolism, excretes harmful toxins from the body and transmits enormous energy in the humans beings.

REFERENCES

1. Importance of *Chakrasana* in Present Generation Dr. Jyoti Gangwal, International Journal of Trend in Scientific Research and Development (IJTSRD) e-ISSN: 2456 – 6470.
2. Bhole MV & Karambedkar PV, Yoga practices in therapeutics, *Yoga Mimansa*, 14(3&4) (1971-72) 27-34.
3. Ghatore ML, Yogic training and physical fitness seminar on Yoga, Science and man, (Min. of Health and Family Planning, Govt. of India), 1975.
4. Dr. Ishwar V. Basavaraddi, Scientific aspect of *Yoga*, page no. 10.
5. Michel beloved/Yogi madhvacharya, Patanjali *Yoga*sutra chaptor 2sadhana pada, verse 46, 47, 48; 2009.
6. Saraswati, Swami Satyananda; *Asana* Pranayama Mudra Bandha, Bihar School of *Yoga*, Munger, 1993.
7. *Yoga* and *Ayurveda*-by Dr. Satyendra Prasad Mishra
8. https://www.naturehomeopathy.com/procedure-and-benefits-of-*Chakrasana*-wheel-pose.html
9. www.naturohomeopathy.com/suryanamaskar-yoga
10. https://en.wikipedia.org/wiki/Surya_Namaskar
11. Saraswati, Swami Satyananda; *Asana* Pranayama Mudra Bandha, Bihar School of *Yoga*, Munger, 1993.
12. Michel beloved/Yogi madhvacharya, Patanjali *Yoga*sutra chaptor 2sadhana pada, verse 46, 47, 48; 2009.
13. B.D. Chaurasia, Text book of Anatomy, 8th edition, Vol. 1.
14. Seals DR, Victor RG, Mark AL (1988) Plasma norepinephrine and muscle sympathetic discharge during rhythmic exercise in humans. J Appl Physiol, 65: 940–944.
15. Katayama K, Ishida K, Iwamoto E, Iemitsu M, Koike T, Saito M (2011) Hypoxia augments muscle sympathetic neural response to leg cycling. Am J Physiol Regul Integr Comp Physiol, 301: R456–R464.
16. Folkow B, Di Bona GF, Hjemdahl P, Toren PH, Wallin BG (1983) Measurements of plasma norepinephrine concentrations in human primary hypertension. A word of caution

on their applicability for assessing neurogenic contributions. Hyperten- sion, 5: 399–403.

17. Leuenberger U, Gleeson K, Wroblewsski K, Prophet S, Zelis R, Zwillich C, Sinoway L (1991) Norepinephrine clearance is increased during acute hypoxemia in humans. Am J Physiol, 261: H1659–H1664.