



A SYSTEMATIC REVIEW ON IMPACT OF *SURYA NAMASKARA* AND *YOGA* ON FEMALE HORMONAL HOMEOSTASIS

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ABSTRACT

Many Female reproductive disorders are now in increasingly perceived as disorder of “changed lifestyles” and are a rainbow “metabolic syndrome”. PCOS like common female endocrine disorder with prevalence ranging from 2.2%-26%. It is a complex disorder affecting 5-15% women in their reproductive age. Any defect in H-P-O axis causes hormonal or chemical imbalance which alters the ovarian function leading to PCOS, which is one of the leading cause of female subfertility. Menstrual irregularities with scanty menstrual flow are the main symptom in women suffering from PCOS. To promote healthy lifestyle and for hormonal homeostasis, *Surya namaskara* is a sequential combination of yogic postures performed dynamically in synchrony with the breath, it warms up the body and acts as a cardio

tonic, whereas when done slowly it strengthens and tones the musculature and enhances functioning of internal organs. These help to burn extra body fat on belly, buttocks and back by modulating endocrinal system. It helps to regulate menstrual cycles. Apart from these benefits of *Surya namaskara* also help to keep the mind stress free, calm and illuminated. It should be a need to incorporate *Surya namaskara* practices in modern lifestyle for healthy mind and body. Yoga suspends the fluctuations of the mind and by acting consciously; we live better and suffer less.

KEYWORDS: Hormonal yoga, endorphins, *Agni*, GnRH, *Artava chakra*.

INTRODUCTION

Lifestyle related disorders associated with physical inactivity and poor diet quality represents a major health burden now a day. A recent survey conducted by Jindal Naturecure Institute

revealed that over one-third of women suffer from lifestyle & mental health issues. To promote healthy lifestyle and for hormonal homeostasis, *Surya namaskara* is a sequential combination of yogic postures performed dynamically in synchrony with the breath, it warms up the body and acts as a cardio tonic, whereas when done slowly it strengthens and tones the musculature and enhances functioning of internal organs. *Surya namaskara* is total coordination of body, breath and mind. It is a complete health capsule for women throughout all stages of life. It is considered a part of modern-day yogic practices. *Surya namaskar* is best done during the early sunrise. As per Ayurveda, the body moves from the *vata* phase before sunrise to the *kapha* phase after sunrise. *Suryanamaskar* at sunrise is the connection between the airy movements of *Vata* and the sluggish *kapha* to activate the fire of *pitta-Agni*. Thus, actively bringing all three *dosha* into play to bring optimal health as defined by Ayurveda.

MATERIAL AND METHODS

Reviewing the Female hormonal homeostasis and impact of *Surya namaskara* on it through classics, commentaries also recently published books and research journals and modern science literature, the collection done and attempt to get co-relation.

Origin of *Surya namaskara*

In *Ramayana*, Sage *Agasthya* advised Lord Sri Rama to worship the sun god by chanting *Aditya Hridayam* to achieve victory in his encounter with the demon king *Ravana*. These verses depict the various forms and names of the sun god, praising his glory and his 12 forms (signifying the shape of 12 months of a year) in the *Yuddha Kanda* of *Ramayana*.^[1] The sun is considered as the *Pratyaksha swarupa* (the ultimate power visible to the eye), which represents truth, a manifestation of knowledge, and the giver of intellect & prosperity.

The sanctity of the sun god is explained in a chapter containing 132 verses named '*Surya namaskar*' in *Taittiriya Aranyaka* under *Krishna Yajur Veda*. This is being chanted as a ritual practice among South Indians along with the performance of namaskara (salutation) at the end of each verse.^[2]

Steps	Name of the Posture	Beeja Mantra/Mantra	Associated Chakra
1	<i>Pranamasana</i> (prayer pose)	<i>Om Hraam/Om Mitraya Namah</i>	<i>Anahata</i>
2	<i>Hasta Utthanasana</i> (raised arms pose)	<i>Om Hreem/Om Ravaye Namah</i>	<i>Vishuddhi</i>
3	<i>Padahastanasana</i> (hand to foot pose)	<i>Om Hroom/Om Suryaya Namah</i>	<i>Swadhisthana</i>
4	<i>Ashwa Sanchalanasana</i> (equestrian pose)	<i>Om Hraim/Om Bhanave Namah</i>	<i>Ajna</i>
5	<i>Parvatasana</i> (mountain pose)	<i>Om Hraum/Om Khagaya Namah</i>	<i>Vishuddhi</i>
6	<i>Ashtanga Namaskara</i> (salute with eight parts or points)	<i>Om Hrah/Om Pushne Namah</i>	<i>Manipura</i>
7	<i>Bhujangasana</i> (cobra pose)	<i>Om Hraam/Om Hiranyagarbhaya Namah</i>	<i>Swadhisthana</i>
8	<i>Parvatasana</i> (mountain pose)	<i>Om Hreem/Om Marichaye Namah</i>	<i>Vishuddhi</i>
9	<i>Ashwa Sanchalanasana</i> (equestrian pose)	<i>Om Hroom/Om Adityaya Namah</i>	<i>Ajna</i>
10	<i>Padahastanasana</i> (hand to foot pose)	<i>Om Hraim/Om Savitre Namah</i>	<i>Swadhisthana</i>
11	<i>Hasta Utthanasana</i> (raised arms pose)	<i>Om Hraum/Om Arkaya Namah</i>	<i>Vishuddhi</i>
12	<i>Pranamasana</i> (prayer pose)	<i>Om Hrah/Om Bhaskaraya Namah</i>	<i>Anahata</i>

Beeja Mantras are the alternatives for the twelve names of the sun, which does not have any meaning as such but yields tremendous vibrations and energy to the body and mind.

Surya Namaskar: Making The Body A Stepping-Stone

The physical body is a fantastic stepping-stone for higher possibilities, but for most people it functions like a road block. The compulsions of the body do not allow them to go forward. Being in sync with the solar cycle is an important part of balance and receptivity, a means of taking the body to the point where it is no longer a hurdle.

The *Suryanamaskar Asana* sequences are aimed at energizing the solar plexus- Manipur chakra, at the navel- which in yogic physiology is the basis of the physical body. This is the plexus for the second mind, popularly called gut instinct, which is related to the vagus nerve, the tenth cranial nerve and the longest of the autonomic nervous system which is responsible for the body's subconscious functioning such as breathing, circulation and digestion and governs our happiness and social relationships. Just as the five elements are present around you, the same elements of ether, air, fire, water, and earth are also present in the human body. The sun is the universal element of fire and the wellspring of life. The fire element *Agni* is that which is the energy conversion factor in all forms of life and is a support of the universe in its microcosmic aspect, all encompassing. It is this same fire in the human physiology that sustains the body as warmth through to the last breath. In *Ayurveda*, there are a total of fourteen sub-types of metabolic fire depending upon the location and function. *Agni* is the same as *pitta dosha* of *Ayurveda* as per *Aacharya Charaka*.^[3]

Benefits of *Surya namaskara*

The dynamic movements in each step of *Suryanamaskar* make the body contract and expand its muscles alternatively and tone up the joints. This makes the stagnant blood at the inactive muscles and joints to be redirected back to the kidneys and lungs for purification.

Suryanamaskara is recommended as a practice to improve cardio-respiratory efficiency both for healthy individuals and cardiac patients.^[4]

Research studies on *Surya namaskara*

Effects on endocrine functions

It helps to relieve any kind of mental disturbance. Imbalance in mental health is often associated with or leads to an imbalance in hormones and thus it manifests as a disease or syndrome e.g. Diabetes, Thyroid dysfunction, and so on. Endocrine glands are toned and massaged by regular practice of this excellent group of *Asana*. *Suryanamaskar* stimulates the brain centers and the associated nerve fibers running throughout the body. It is emphasized that in addition to the benefits that these group of *Asanas* bestows to each physiological system in the body, it also provides a balance between the circulatory, respiratory and endocrine systems with one another and thus helps in the prevention of diseases.^[5]

Endocrine glands and the major nervous plexuses are often associated with the *Chakras* at the physical level. The *Chakra* means a 'whirlpool' or a 'vortex'. *Chakra* lies dormant and inactive in most people and by *yogic* practices the flow of energy through the *Chakra* can be stimulated and they can be activated. Each *Chakra* is connected to the '*nadis*' which are the network of psychic channels. Most important *Chakras* are seven in number and located along the energy channel '*Sushumna*' which flows through the center of the spinal cord.^[6] The *Chakras* are depicted as lotus flowers with a distinct number of petals and characteristic colour. The name & location of the seven *Chakras* and the physical correlation with the glands are tabulated in.^[7]

Chakra and anatomical location in the human body

<i>Chakra</i>	Anatomical Location	Physically correlated glands
<i>Mooladhara</i>	Perineum	Gonads
<i>Swadhisthana</i>	Coccyx	Genital organs
<i>Manipura</i>	Navel	Gastric glands, Pancreas, Adrenal

<i>Chakra</i>	Anatomical Location	Physically correlated glands
<i>Anahata</i>	Heart	Thymus
<i>Vishuddhi</i>	Throat	Thyroid
<i>Ajna</i>	Top of spine	Pineal
<i>Sahasrara</i>	Crown of the head	Pituitary

The 12 hatha yoga positions during the practice of Surya Namaskar on the right side activate the Pingala (Sun channel- the right nostril-sympathetic system) to give physical energy and a dynamic start to the day. The left side movement activates the Ida (moon channel, left nostril, parasympathetic system) to create a meditative spiritual practice of Surya Namaskar. Ideally, both sides are used in tandem during a round of two cycles (one of right side and one of left side) to create a harmonious Ida-pingala flow of energy and bring about awareness of consciousness through planned movement of the physical body.

In research study, Chatterjee & Mondal reported the levels of Serum Growth hormone and Dehydroepiandrosterone (DHEAS) in the *yogic* training group when compared to the control group. In the *yogic* training group in which *Suryanamaskar* is also one of the practices along with other *Asanas* and *Pranayama*, a significant increase in GH and DHEAS levels was reported when compared to the control group. *Suryanamaskar* is reported to activate all glands in the body including pituitary and adrenal glands both of which are responsible for positive neuroendocrine feedback for proper maintenance of GH and DHEAS levels.^[8]

Physical health goes hand in hand with the mental health of a person in line with the proverb “A sound mind in a sound body”. Studies with Schizophrenia patients suggested that *Yoga* therapy along with conventional medical treatment could improve their psychic states. And thus, it is evident that *Surya namaskar* works not only at physical, physiological levels but also at the psychic levels of the practitioner.^[9]

From the scientific point of view, it improves the metabolic functioning of the body and regulates the secretions of the glands. Therefore, it is very clear that the practice of *Suryanamaskar* helps in keeping the mental health and the equilibrium of the state of mind, as metabolism and glands directly affect the mind.

Suryanamaskar plays an important role in balancing the functioning of endocrine glands. This property helps to regulate/delay the transition period between childhood and adolescence in growing children, especially in females. Puberty and followed by Menarche is an important process in every female's life that prepares their body for reproduction. Due to environmental factors and food habits, Puberty/Menarche is advanced to an early age, when the body is not well prepared to undergo those processes. This leads to various complications in their menstrual cycle, mood disorders, dysmenorrhea, infertility, complications in childbirth, risks of cardiovascular disease, and decreased life expectancy. *Suryanamaskar* plays a vital role in delaying the age of puberty in a girl child and prepares the body for the necessary changes to happen. Hence it is important to introduce *Surya namaskar* at a young age as early as 7 years.^[10]

One-hour *Yoga* session for 12 weeks comprising of *Suryanamaskar*, *Asana*, *Pranayama*, and meditation in adolescent girls having polycystic ovarian syndrome (PCOS), showed significant alterations in blood glucose, insulin, and lipid levels.^[11]

A brisk *surya namaskar* performed in an energetic way increases cellular requirements for oxygen and glucose. To meet these requirements, insulin production is stimulated through brain signaling.^[12]

In a study, a yoga intervention consisting of 25 minutes of *Surya namaskar* along with other yoga postures and a deep relaxation technique in perimenopausal women resulted in a significant decrease in diastolic blood pressure and hip circumference, and beneficial effects on glycaemic outcomes.^[13]

DISCUSSION

WHO report noted that a markedly larger annual disease burden of 3.3 billion DALYs worldwide might result from very low levels of Ultra violet radiation exposure. This burden subsumes major disorders of the musculoskeletal system and possibly an increased risk of various autoimmune diseases and life-threatening cancers. The best-known benefit of sunlight is its ability to boost the body's vitamin D supply; most cases of vitamin D deficiency are due to lack of outdoor sun exposure. At least 1,000 different genes governing virtually every tissue in the body are now thought to be regulated by 1,25-dihydroxyvitamin D₃ (1,25[OH]D), the active form of the vitamin, including several involved in calcium metabolism and neuromuscular and immune system functioning.^[14] Practice of

Suryanamaskar is necessary not just for those who are regular *yogic* practitioners or spiritual seekers but for a common man, to maintain the physical, physiological, and mental health by spending very little time of their choice. If this practice is initiated to children at the age of 7 or 8 it helps grow better not only physically but also with great mental health. We propose that *Suryanamaskar* practice could be a group activity of the family to ensure total family health.

CONCLUSION

Surya Namaskara movement series can balance the system of the internal organs (human) primarily related to the respiratory system, circulatory system, digestive system, urinary or urine system, skin system, brain system, and endocrine system. The endocrine glands include the pituitary gland, pineal gland, thyroid gland, parathyroid gland, thymus gland, adrenal gland, and gonads gland. Regarding the internal organs balance, the healthy will always be physically or mentally as well as become calm and peaceful. Overall *Surya namaskara* along with other yoga & oral Ayurveda medications can help in hormonal homeostasis & eradicating infertility, dysmenorrhea, adenomyosis, endometriosis and abnormal uterine bleeding like disorders and thus improves female's quality of life.

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