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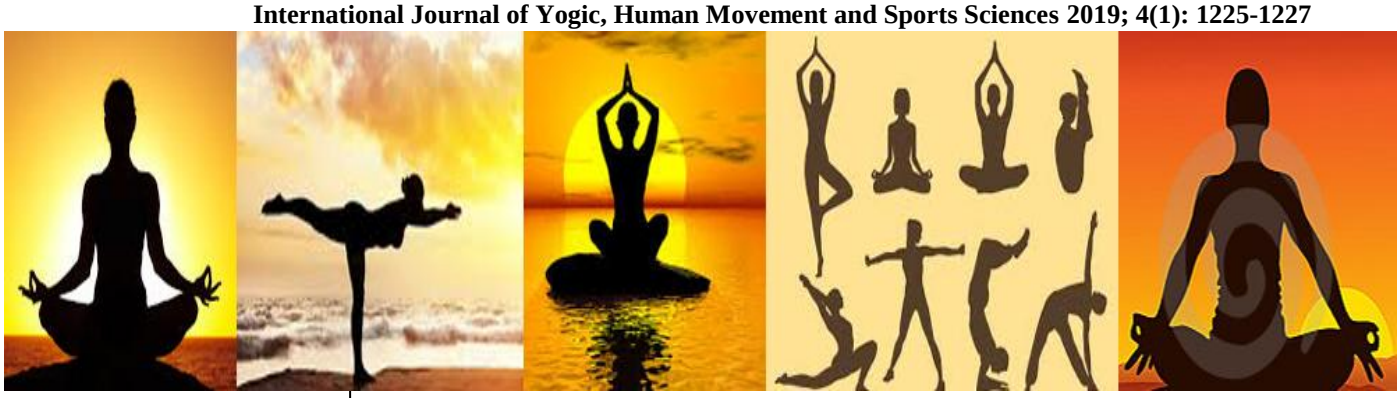

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Physiological approach of Asanas in Ayurveda

Dr. Aparna Singh and Dr. Lowkesh Chandravanshi

Abstract
Asana occupies first place in hath yoga while it is third in *Patanjali's Ashtang Yoga Sutra*. The *Asana* in *Yoga*, traditionally means a "sitting condition" or position of the body which contributes to the steadiness of the body and mind as well as well- being of an individual. *Asanas* are the modified part of the three basic human postures i.e. standing, sitting or lying posture. The practical implication of *Asanas* practice to change the stress response is different in different traditions. The yoga practice that focuses only on physical remedies is limited, for it deals only with physiology and not psychology. Similarly a practice that is formed around moral percepts and exhortations to change one's lifestyle has distinct limitations, for behavior modification is not simple. This paper deals with physiological approach of *Asanas* and also focuses on the recent research work done which indicate the benefits of *Asanas* on relieving stress and achieving good health.

Keywords: Asana, yoga, exercise

Introduction
Yoga has nowadays become an essential component of life to deal with disturbed lifestyle and increasing stress in society. It is an extraordinary spiritual science which promotes self development and self realization and enables us on how to develop our physical, vital, mental, emotional, psychic and spiritual aspects. The Asana in Yoga, traditionally means a "sitting condition" or position of the body which contributes to the steadiness of the body and mind as well as well- being of an individual. Asana hold's third place in Maharishi Patanjali Ashtanga Yoga and is usually defined as a body posture held with stability and ease (*sthirasukhamasanam*). Asanas are the modified part of the three basic human postures i.e. standing, sitting or lying posture.

The practical implication of Asanas practice to change the stress response is different in different traditions. The yoga practice that focuses only on physical remedies is limited, for it deals only with physiology and not psychology. Similarly a practice that is formed around moral percepts and exhortations to change one's lifestyle has distinct limitations, for behavior modification is not simple.

An Asana is an attitude, which is psycho-physiological in nature. The most of these patterns are based on the natural postures of various animals, birds or even the symbols like tree, lotus etc. A gradual training is given to the whole body as well as the mind through particular neuromuscular mechanism involved in different postural patterns. Hence it is the pattern of the posture involved in asana which is important and responsible to achieve stillness of body and mind [1].

Materials and methods
An extensive search on Asanas was undertaken as well as relevant data were searched in different ayurvedic literatures as well as the research papers published in different scholarly journals were also searched online from various scientific electronic database viz. Pubmed, Google scholar, Science direct etc.

Discussion
Asana occupies first place in hath yoga while it is third in Patanjali's Ashtang Yoga as Sthirasukhaasanam (Patanjali's Yoga Sutra II:46) attributes that asana is that which contributes

to stability and comfort. Here stability does not mean the stability of body but the stability of both body and mind that leads to sense of well being. The relaxed condition or effortless maintenance of asana could make the mind free to be attached with infinity. The act of Yoga Asanas can be perceived externally and has gathered attention worldwide and many researchers have studied effects of this limb of Yoga.

Physiological aspects of Asanas

The central nervous system (CNS) uses its lower centers of integration that is responsible for maintenance of posture and equilibrium. These centers are situated in the medulla and pons, midbrain (brain stem nuclei), cerebellum and basal ganglia. The reflexes are integrated by these lower centers below the level of consciousness to maintain the posture. This involuntary control depends on the information coming from the proprioceptors, situated in muscles, joints, tendons and soles. The postural reflexes and the muscle tone are well regulated by the lower centers quite independently and efficiently even when the higher centers in the cortex are not involved.

Asana when practiced by an individual for the first time a little exertion is caused to the muscles, joints and tendons. The joints and the concerned muscles are not flexible and hinder resistance. As one progress in practice and improves his performance of asanas these feelings gradually disappear and subsequently can practice them quite easily, without any exertion. The time holding for particular asanas in the final stage is slowly increased.

Yogasana and exercise

Yogasana often been thought of as form of exercise are really techniques which play in keeping the physical body in position and in cultivating awareness, relaxation concentration and meditation. *Asana* is complementary to exercise because in this process there is development of good physical health by stretching, massaging to affect body mechanism. Exercise imposes a beneficial stress on the body. Without it the muscles waste, the bone become weak, the capacity to absorb oxygen decreases, insulin insensitivity can be occur, and the ability to the meet the physical demands of sudden activity is lost.

Difference between *Yoga asana* and exercise

- When *yogasanas* are performed, respiration and metabolic rates slow down, the consumption of oxygen and body temperature drop.
- During exercise however, breath and metabolism speed up, oxygen consumption rises, and body gets hot.
- *Yoga* postures tend to arrest catabolism where as exercise promotes it.
- *Asanas* are designed to have specific effects on the glands and internal organs, and to alter electrochemical activity in the nervous system.

The *asanas* are classified in to three groups- beginners, intermediate, and advanced. It is not necessary to perform all the asana in a particular group. Regular practice of a balanced program, tailored to individual needs is recommended for maximum benefit.

The beginners group should be performed by those who have never practiced *yogasanas* before. Only a selection from this group, tailored to individual needs, should be practiced by those who are inform in any way, weak or sick. They will give greater benefits than more difficult practices. These are very useful in improving physical health. Included in this group are the *Pawanmuktasana* series (procedure of relaxation from head to toe), *Suryanamaskar*, premeditation and *pranayama* practices.

Exercise may indeed be stress reducing, as multiple studies have concluded, but the self-observation necessary to recognize and stop the deleterious effects of the stress response before it spirals out of control is the key. One can learn to feel the stress response as physical symptoms, rapid heartbeat, fast, shallow breathing; gastrointestinal upset; sleep disturbances. The decision to stop and address the problem, to admit that it is there and that it is no longer acceptable or productive is difficult. One needs to interrupt a cycle of behavior already set in motion. Perhaps the stress response actual feels comfortable, for it is known, habitual. A daily *Yoga* practice provides the time and space to experience the sensations of the body, and to interpret them. But a practice may also mask symptoms if it is driven by a list of actions to do and ways to do them. Then the desire to do the "right" thing, the "right" way, or the most "spiritual" thing, becomes another prison, not liberation.

The asanas were broadly classified into three main groups depending on their course of action which are as follows [2]:-

1. **Cultural Asanas:** They aimed at reconditioning of the body and mind in order to bring stability, peace and sense of well being. The postural defects disturbed the function of various systems, improper muscle tone must be corrected in order to cultivate correct mental attitude.
   - **Sub group A: Asanas working on the spinal column** Bhujangasana, Shalabhasana, Dhanurasana, Ardha-matsyendrasana, Chakrasana, Vakrasana, Ushtrasana.
   - **Sub group B:- Asanas working on interocepts-**

a) Asanas working on and through proprioceptors: Baddhapadmasana, Gomukhasana, Matsyasana, Vajrasana, Trikonasana, Bhadrasana, Padahastasana, Supta- Vajrasana.

b) Asanas working on and through visceroreceptors: Yoga mudra, Paschimottasana, Mayurasana, Ardha-matsyendrasana, Supta Vajrasana, Halasana, Pavan muktasana.

- **Sub group C: Asanas working on vestibular organs:-** Sarvangasana, Viparitkarni, Garudasana, Vrikshasana, Kukutasana, Bakasana, Padhhastana.

2. **Relaxative Asanas:** Shavasana and Makrasana are two important relaxative asanas which bring about relaxation of the body and mind.
3. **Meditative Asanas:** These asanas provide a comfortable and stable position of the body to make the mind more and more steady for the process of medication, dharana, Samadhi etc. Padmasana, Sidhasana, Swastikasana are recommended.

Relevant research regarding the physiology of Asana

The study by Manjunatha (2005) [3] *et al.* studied the effect of certain yogic postures on fasting and postprandial glycemia and insulinemia in healthy young subjects and concluded that the performance of Asanas that led to increase sensitivity to glucose. It was observed that performance of four different sets of asanas had similar effects of reducing fasting and postprandial glycemia and that blood insulin levels also fall after performance of asanas. Subsequently when oral GTT was administered, it was observed that greater insulin response that may be interpreted as an enhanced sensitivity of pancreatic beta cells to the glucose challenge [3].

Another study conducted by Bhavanani *et al*., 2014 from CYTER, Pondicherry evaluated the time course of cardiovascular changes during and after performance of different *asanas*. It was observed that post postural HR and BP both fell below the initial values during the recovery period and this was consequently seen to be even lower than the responses to supine relaxation in *shavasana*. The effect of supine relaxation is more pronounced after performance of the *asanas*, as compared to just relaxing in *shavasana*. This may be attributed to a normalisation and resultant homeostatic effect occurring due to a greater, healthier de-activation of autonomic nervous system occurring due to the presence of a prior activation. One of the extra findings of that study is the revelation of subtle differences between right-sided and left-sided performance of *vakrasana* and *janusirasasana* that may be occurring due to the different internal structures beingeither compressed or relaxed on either side. This requires further exploration and studies with a greater number of subjects and doing *asanas* in different positions may help unravel basis of such differences [4].

A recent prospective study by Polis et.al 2015 evaluated the safety of *asanas* in 25 healthy pregnant women between 35-37 weeks of gestation. Various tests including baseline non-stress test, vital signs, and pulse oximetry were performed following which the participants assumed the 26 yoga postures. Vital signs, pulse oximetry, tocometry, and continuous fetal HR monitoring were obtained during each of the postures. They then obtained post-session non-stress test, vital signs, and pulse oximetry and participants contacted 24 hours post-session. Both pre-session and post-session non-stress tests were reactive while there were no changes in maternal heart rate, temperature, pulse oximetry, or fetal HR post session. During the 26 yoga postures, vital signs, pulse oximetry, and uterine tocometry remained normal in all women and in all postures and fatal HR across all 26 postures were normal. There were no falls or injuries during the total cumulative 650 poses and there were no reports of decreased fatal movement, contractions, leakage of fluid, or vaginal bleeding in the 24-hour follow-up [5].

Conclusion

Yogasana often been thought of as form of exercise are really techniques which play in keeping the physical body in position and in cultivating awareness, relaxation concentration and meditation. *Asana* is complementary to exercise because in this process there is development of good physical health by stretching, massaging to affect body mechanism. The asana is that which contributes to stability and comfort. Here stability does not mean the stability of body but the stability of both body and mind that leads to sense of well being. The relaxed condition or effortless maintenance of asana could make the mind free to be attached with infinity. The act of Yoga Asanas can be perceived externally and has gathered attention worldwide and many researchers have studied effects of this limb of Yoga.

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