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RESEARCH ARTICLE

CONCEPTUAL STUDY OF SIMHASANA: AN ANALYTICAL REVIEW

^{1,*}Dr. Dharmendra Choudhary, ²Dr. Sunil Kumar Yadav, ³Dr. Kashinath Samagandi
and ⁴Dr. Praveen Kumar

¹MD Scholar PG Department of Sharir Rachana NIA Jaipur Rajasthan

²Associate Professor PG Department of Sharir Rachana NIA Jaipur Rajasthan

³Assistant Professor PG Department of Swisthvritta and Yoga NIA Jaipur Rajasthan

⁴MD Scholar PG Department of Agad Tantra and Vyahar Ayurveda NIA Jaipur Rajasthan

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ABSTRACT

Yoga practices traditionally involve multiple components which should be practiced to yield the benefits of Yoga. This includes physical postures with stretching, breathing exercises and deep relaxation. Yoga is a form of mind-body fitness that involves a combination of muscular activity and an internally directed mindful focus on awareness of the self. Improved flexibility is one of the first and most obvious benefits of yoga which made it so popular. And in the practice of Hatha Yoga, it is plainly the musculoskeletal system that enables us to achieve external balance, to twist, bend, and turn upside down, to be still or active.. It is important for to understand what is occurring within the body to increase the blood flow to each muscle, and how this will affect the body, while performing *Simhasana*. Knowledge of anatomy will help to reassure people and guide them towards rehabilitation and a better lifestyle.

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INTRODUCTION

Yoga is a spiritual science for the integrated and holistic enlargement and magnification of our physical, mental as well as moral-spiritual facets. Yoga is based on the philosophy that is practical and useful for our daily lives. Our present day life is so chaotic and stressful that even thinking of ancient days soothes our heart and brain. The lifestyle of human beings with the passage of time has gradually changed. Science has dominated the present age and the modern man fully depends on it. Physical labour has reduced and ultimately the health of modern man has weakened due to lack of workout. In this age of competition, life is so hard and stressful that man is unable to cope up and hence suffering from various psychological and mental disorders. Yoga provides the best solution of these problems to which modern man is the sufferer. No other exercise, except Yoga, can deal with these problems all together. This name *Simhasana* comes from the Sanskrit words '*Simha*' which means "Lion" and asana means "posture" or "seat". It translates as the 'Lion Pose' as the *yogi* imitates the lion with his jaws thrown wide apart and his tongue fully stretched out. It is first described in the *Yoga Yajnavalkya*.

According to the *Hatha Yoga Pradipika*, it is one of the first four and most important of the 84 *Asana* taught by Lord *Shiva*. This study will be fulfilling the essential quest of asana practitioner about the anatomical structures involved in the *Simhasana* and how this involvement is beneficial in maintaining health or in management of any disease.

Technique of *Simhasana*: Place the ankles below the scrotum in such a way that left ankle on the right side and the right ankle on left side. The knees should be placed on the ground and hands placed on the knees. Mouth should be kept open and tongue protruded. By practicing *Jalandharamudra* one should focus on the tip of the nose. This is called *Simhasana* and it is destroyer of all the diseases (Mallinson, James).

Benefits

- *Simhasana* is adored by the prominent *yogis* and it's an excellent *asana* which facilitates adopting the three *bandhas* (Swatmarama, 1952).
- *Simhasana* cures foul breath and cleans the tongue. It makes speech clearer so this *Asana* is recommended to stammerers. It also helps one to master the three *Bandhas*. Second technique also clears foul breath, tongue becomes cleaner and words are enunciated clearly.

*Corresponding author: Dr. Dharmendra Choudhary,

¹MD Scholar PG Department of Sharir Rachana NIA Jaipur Rajasthan.

Table 1. Muscles which are stretched at ankle joint in *Simhasana*.

Muscle	Location	Nerve supply
Tibialis anterior	Anterior compartment of leg	Deep peroneal nerve (L4-S1)
Extensor digitorum longus	Anterior compartment of leg	Deep peroneal nerve (L4-S1)
Extensor hallucis longus	Anterior compartment of leg	Deep peroneal nerve (L4-S1)
Peroneus tertius	Anterior compartment of leg	Deep peroneal nerve (L4-S1)
Extensor digitorum brevis	Dorsum of foot	Terminal branches of the deep peroneal nerve (S1-S2)
Extensor hallucis brevis	Dorsum of foot	Terminal branches of the deep peroneal nerve (S1-S2)

Table 2. Muscles stretched at knee jointin *Simhasana*

Muscle	Location	Nerve supply
Vastus medialis	Anterior compartment of thigh	Femoral nerve (L2-L4)
Vastus intermedius	Anterior compartment of thigh	Femoral nerve (L2-L4)
Vastus lateralis	Anterior compartment of thigh	Femoral nerve (L2-L4)
Rectus femoris	Anterior compartment of thigh	Femoral nerve (L2-L4)

Table 3. Muscles Stretched passively at hip jointin *Simhasana*

Muscle	Location	Nerve supply
Adductor Longus	Medial compartment of thigh	Obturator nerve (L2-L4)
Adductor Magnus	Medial compartment of thigh	Obturator nerve (L2-L4) Sciatic nerve (L4)
Adductor Brevis	Medial compartment of thigh	Obturator nerve (L2-L4)
Pectineus	Medial compartment of thigh	Femoral nerve(L2,L3)
Gracilis	Medial compartment of thigh	Obturator nerve (L2-L4)
Gluteus maximus	Gluteal region	Inferior gluteal nerve (L4-S2)

Table 4. Muscle in contraction at hip jointin *Simhasana*

Muscle	Location	Nerve supply
Tensor fascia lata	Gluteal region	Superior gluteal nerve (L4-S1)
Gluteus medius	Gluteal region	Superior gluteal nerve (L4-S1)
Gluteus minimus	Gluteal region	Superior gluteal nerve (L4-S1)
Piriformis	Gluteal region	Branches from S1 and S2
Gemellus superior	Gluteal region	Nerve to obturator internus (L5, S1)
Gemellus inferior	Gluteal region	Nerve to quadratus femoris (L5, S1)
Obturator internus	Gluteal region	Nerve to obturator internus (L5, S1)
Psoas major	Iliac Region	Ventral rami of the lumbar spinal nerves (L1, L2)
Iliacus	Iliac Region	Femoral nerve (L2, L3)

Table 5. Muscle in contraction at thoracic and lumbar spinein *Simhasana*.

Muscle	Location	Nerve supply
Erector spinae	Back	Lateral branches of the Dorsal rami of the cervical, thoracic and lumbar spinal nerves
Quadratus lumborum	Posterior abdominal wall	Ventral rami of the twelfth thoracic and upper three or four lumbar spinal nerve

Table 6. Muscles in contraction at cervical regionin *Simhasana*

Muscle	Location	Nerve supply
Sternocleidomastoid	Cervical	Spinal part of the accessory nerve Ventral rami of C2 and C3
Longus colli	Anterior Vertebral	Ventral rami of the C2, C3, C4, C5 and C6.
Longus Capitis	Anterior Vertebral	Ventral rami of the C1, C2 and C3.
Rectus Capitis anterior	Anterior Vertebral	Ventral rami of the C1 and C2.
Scalenus anterior	Lateral Vertebral	Ventral rami of the C4, C5 and C6.

Table 7. Muscles Stretched at cervical region in *Simhasana*.

Muscle	Location	Nerve supply
Trapezius.	Scapular	Spinal accessory nerve, C3 and C4.
Longissimus Capitis	Cervical	Dorsal primary rami of C3 to C8
Longissimus Cervicis	Cervical	Dorsal primary rami of C4 to C8
Semispinalis Capitis	Cervical	greater occipital nerve (C2) and the third cervical nerve (C3)
Semispinalis cervicis	Cervical	Dorsal primary rami of C3 to C5
Splenius Capitis	Cervical	Dorsal primary rami of C2 and C3
Splenius Cervicis	Cervical	Dorsal primary rami of C5 to C7
Suboccipital muscles	Cervical	Dorsal primary rami of C1
Rectus capitis posterior major		
Rectus capitis posterior minor		
Obliquus capitis superior		
Obliquus capitis inferior		

Table 9. Muscles contracting at elbow joint in *Simhasana*

Muscle	Location	Nerve supply
Triceps brachii	Posterior compartment of arm	Radial nerve (C6-C8)

Table 10. Muscles stretched at elbow joint in *Simhasana*.

Muscle	Location	Nerve supply
Brachialis	Anterior compartment of arm	Musculocutaneous nerve (C5,C6)
Brachioradialis	Posterior compartment of forearm	Radial nerve (C5-C6)

It exercises the liver and control flow of bile. It also relieves painful coccyx (Iyengar, 1979).

Anatomical aspects of *simhasana*

Anatomy of *Simhasana*

Joint positions

- The ankles plantar flexed.
- The knees flexed
- The hips are flexed and abducted
- The lumbar and thoracic spine erect.
- The cervical spine flexed.
- The shoulder internally rotated and adducted
- The Elbow extended

Muscles and ligaments involved in *Simhasana*

Ankle and foot region

Ankles Plantarflexed

In *Simhasana* the position of legs is somewhat similar to that of *Vajrasana*. Here the ankles cross each other. The left ankle is under the right perineum and vice versa. The ankle is plantarflexed and by resting on the heels, there is maximum stretch at ankle joint. The muscles of anterior compartment of leg and dorsum of foot are stretched here. Among these muscles extensor digitorum longus, extensor hallucis longus, tibialis anterior and peroneus tertius belongs to anterior compartment of leg.

These muscles are supplied by deep peroneal nerve (L4-S1). While extensor digitorum brevis and extensor hallucis brevis belongs to the dorsum of foot. Both are supplied by the lateral terminal branches of the deep peroneal nerve (S1-S2).

Knee Joint

Knee joint is flexed: The positions of knees are similar to *Vajrasana*. The knees are flexed and it stretches the extensor compartment or anterior compartment of thigh. This compartment consists of Sartorius and quadriceps femoris which includes rectus femoris, vastus lateralis, medialis and intermedialis. These are supplied by femoral nerve. Sartorius is a flexor of hip and knee joint and hence not stretched here.

Ligaments of knee joint: Knee joint is flexed. In this position the maximum pressure is on the following ligaments

- Medial and lateral meniscus

Hip and Pelvic region

Hip joint if flexed and abducted: The position of hip is similar to that of *Bhadrasana*. In *Simhasana* the hip is flexed and abducted. The adductors are stretched and similarly the extensors of hip. The adductor compartment or medial compartment of thigh is stretched when hip is abducted. This compartment comprises of gracilis, adductor longus, magnus and brevis.

The pectineus is the proximal muscle in the adductor group. It adducts, and internally rotates the hip. Hence it's stretched in this pose. The hip joint is flexed and abducted. So the flexors and abductors are in active contraction in *Simhasana*. The principle abductors are gluteus medius, gluteus minimus and tensor fascia lata. Among lateral rotators of the hip piriformis, gemellus superior, gemellus inferior and obturator internus helps in abduction of the flexed thigh. The psoas major along with iliopsoas helps in flexing of hip.

Ligaments of hip joint: The hips are flexed and abducted. The ligaments more stretched are

- Pubofemoral ligament

Table 11. Muscles in contraction at wrist and hand in *Simhasana*

Muscle	Location	Nerve supply
Extensor pollicis longus	Posterior compartment of forearm	Posterior interosseous nerve (C7,C8)
Extensor pollicis brevis	Posterior compartment of forearm	Posterior interosseous nerve (C7,C8)
Abductor digiti minimi	Intrinsic muscles of the hand	Deep branch of the ulnar nerve
Dorsal interossei	Intrinsic muscles of the hand	1 st and 2 nd by the median nerve 3 rd and 4 th by the deep terminal branch of the ulnar nerve

Table 12. Muscles in contraction at mouth and tongue in *Simhasana*

Muscle	Location	Nerve supply
Lateral pterygoid	Muscle of mastication	Lateral pterygoid nerve from the mandibular nerve
Digastric	Neck	Anterior belly - mandibular division (V3) of the trigeminal (CN V) posterior belly - facial nerve (CN VII)
Mylohyoid	Neck	Mylohyoid nerve, from inferior alveolar branch of mandibular nerve
Geniohyoid	Neck	C1 via the hypoglossal nerve
Platysma	Neck	Cervical branch of facial nerve
Genioglossus	Extrinsic muscle of tongue	Hypoglossal nerve

The Spine: Thoracic and Lumbar

The lumbar and thoracic spines are erect: The position of spine in *Simhasana* described in *Gherandasamhita* is similar to that of *Vajrasana*. To maintain an upright shape, the erector muscles contract to extend the spine, and the psoas major and minor contract to pull the anterior lumbar spine forward to restore the lumbar curve. Quadratus lumborum act as synergist to the function of erector spinae and helps in maintaining lumbar lordosis.

Cervical Region: Cervical spine flexed. Similar to *Siddhasana* and *Padmasana Jalandhara bandha* is also applied in *Simhasana*. The important muscle in creating the lock formed in *Jalandhara bandha* is sternocleidomastoid. It acting together draws the head forwards and so help to flex the cervical part of the vertebral column, sternocleidomastoid is supplied by the spinal part of the accessory nerve. Rectus capitis anterior, Longus capitis and Longus colli flexes the head at the atlanto-occipital joints. The muscles stretched in *Simhasana* are similar to that of *Siddhasana and Padmasana*. The upper fibres of trapezius is stretched most, it elevate the scapula and is innervated by the spinal part of the accessory nerve. Other muscles being stretched are splenius, splenius cervicis, semispinalis capitis and longissimus capitis. The suboccipital muscles are rectus capitis posterior major, rectus capitis posterior minor, obliquus capitis inferior and obliquus capitis superior are involved in extension of the head at the atlanto-occipital joints and rotation of the head and atlas on the axis.

The Shoulder region: The shoulders are flexed, adducted and internally rotated. The position of shoulders in *Simhasana* is similar to *Vajrasana*. The upper limb is kept straight and the palms are rested at the knees. The shoulder joint is almost at ease and there isn't much stress at shoulder joint. The position of shoulder joint is in flexion, adduction and internal rotation. But as the hands rests at knees the muscles are relaxed in this position. Even though the shoulder is in flexed, adducted and internally rotated, there isn't much deviation from the resting position of shoulder joint. The extensors are slightly stretched in this position. The extensors include the latissimus dorsi and teres major. Latissimus dorsi is the extensor, adductor and medial rotator of shoulder joint. Teres major is an extensor and also a medial rotator.

Elbow region

Elbow extended and Forearm pronated: Similar to *Vajrasana*, in *Simhasana* also the upper limb is kept straight and the elbow is extended. The forearm is in pronated position and the forearm is in a relaxed state. To maintain the extension of elbow joint the triceps brachii is actively contracted. As the elbow is flexed and forearm is pronated, the flexors are stretched in this position. The primary flexor of elbow joint is brachialis muscle which is supplied by musculocutaneous nerve.

Wrist and Hand: The palms of the hands are placed over the knees. The wrist and fingers rests on the knees and the fingers are wide apart. There is abduction of fingers and extension of the thumb. The extension of thumb is done by extensor pollicis longus and brevis muscles. Dorsal interossei muscles abduct the fingers from the middle finger. Abductor digiti minimi also helps in abduction of little finger

Mouth and tongue

Depression of Mandible and tongue protruded: Out of the four muscles of mastication, the lateral pterygoid is the only muscle of mastication that assists in depressing the mandible and helps in opening the jaw. At the beginning of this action it is assisted by the digastric, mylohyoid and geniohyoid muscles. Lateral pterygoid has assumed a specialized role in mandibular opening that is mediated by its horizontally orientated fibres. When left and right muscles contract together, the condyle is pulled forwards and slightly downwards. This protrusive movement alone has little or no function except to assist in opening the jaw. Digastric and geniohyoid are the main jaw opening muscles. The platysma muscle can also be contracted and tonified in *Simhasana*. Genioglossus brings about the forward traction of the tongue to protrude its apex from the mouth.

DISCUSSION ON SIMHASANA

The basic joint positions in *Simhasana* are ankles plantar flexed, knees flexed, hips are flexed and abducted. The lumbar and thoracic spine erect, and cervical spine flexed. In Upper limb the shoulder internally rotated and adducted and the elbow extended. *Simhasana* is useful for alleviating numerous throat, mouth, nose and even ear diseases. *Simhasana* is particularly good for toning the throat and eradicating stammering. Stammering is involuntary interruption or inability to pronounce a syllable or letter while talking. Causes of Stammering Inability to control muscles of the organs of speech and difficulty in the movement of the tongue and lips. *Simhasana* stimulates the platysma and contracts Lateral pterygoid, digastric, Mylohyoid, Geniohyoid, and genioglossus. By practising *Simhasana*, the muscles of neck region get stretched which help to make the tongue strong. Production of sound like lion during *Simhasana* helps in the activation of wiring area of brain. This mechanism very useful in treating the stammering.

Conclusion

Simhasana is described in almost all of the classical texts of Hathayoga. In *Gheranda Samhita* the position of lower limbs are similar to *Bhadrasana*. The heels are kept at perineum crossing each other. The lumbar and thoracic spine erect and cervical spine flexed. Head flexed and the chin rests at chest. Mouth wide open and tongue protruded. The fingers are abducted and rest at knees. The muscles of the dorsum of foot, anterior compartment of leg, anterior and medial compartment of thigh are stretched most in lower limb. The extensors of cervical region are stretched in the trunk. Upper limb is almost at ease. As the mouth wide open the depressors of mandible and muscles protruding tongue are in active contraction.

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