



ROLE OF YOGIC PRACTICE IN SCIATICA PAIN

Yoga

**Siddappa
Naragatti**

Yoga Therapist, Central Council for Research in Yoga and Naturopathy New Delhi

Dr. Sindhushree. A. T Senior Research Fellow, Central Council for Research in Yoga and Naturopathy New Delhi

Dr. Vadiraja H. S Research Officer, Central Council for Research in Yoga and Naturopathy New Delhi

ABSTRACT

Herniation of one or more lumbar intervertebral discs is a common and frequently incapacitating occurrence that causes radicular pain in the sciatic nerve's distribution. This condition is thought to occur between 13% and 40% of the time in a lifetime. The common sign of sciatica is an excruciating shooting pain that travels from the gluteal region to the foot. Pain from sciatica can be significantly diminished by doing mild yoga exercises. Patients with sciatica often find tremendous comfort through yoga asana and calm, deliberate breathing. In order to manage their discomfort and avoid serious problems, it provides patients with the appropriate support. This review covers the introduction, cause of sciatica, do's and don'ts if you have sciatica, and how to use yoga poses to treat and prevent sciatica pain. An important step forward in our understanding of sciatica pain came in 1934, the year of William Jason Mixter and Joseph S. Barr's ground-breaking work. Additionally, manual searches of pertinent journals were done. And fortunately, the majority of patients respond favorably to straightforward analgesics and physical therapy. However, the condition has the potential to worsen and become chronic, with significant socio-economic implications. In this both allopathic treatment and yoga contribute to the management of Sciatica. Yoga can be used as a complementary therapy for people recovering from Sciatica. It may help restore flexibility, strength, and range of motion and improve overall physical and mental well-being during the recovery process.

KEYWORDS

Sciatica Nerve Pain Yogic Practices Role

INTRODUCTION

Sciatica pain is caused by the compression, irritation, or damage to the sciatic nerve, which originates in the lower back and branches out to both sides of the body, passing through the buttocks, thighs, and knees. It is often characterized by sharp, shooting, burning, or stinging sensations and typically affects one side of the body. Unfortunately, a large number of people worldwide suffer from sciatica pain, which significantly impacts their quality of life and can lead to feelings of depression.

Despite the prevalence of sciatica pain, many individuals are unaware of the importance, effects, and benefits of Indian Traditional Yogic practices in managing this condition. However, in recent times, there has been increased awareness and understanding of yogic practices among the global population. Specific yogic practices tailored for sciatica pain have proven to be effective in reducing symptoms and preventing further complications. These practices involve conscious postures, breath awareness, and meditation, which provide significant support to patients when executed correctly and with consideration for individual preferences.

Ancient sages, scholars, and researchers have conducted extensive studies on sciatica pain and its underlying causes. Traditional medicine books dating back to the 2nd century AH (After Hijri) contain references to sciatica pain, and throughout the 20th century, various traditional perspectives on the condition were established. In ancient medical practices, sciatica pain was attributed to imbalances in the body's four types of humor or body fluids: black bile, yellow bile, phlegm, and blood^{1,2}.

A pivotal moment in the understanding of sciatica pain came with the groundbreaking work of William Jason Mixter and Joseph S. Barr in 1934. In their article published in the *New England Journal of Medicine*, they established the fundamental connection between intervertebral discs and sciatica, revolutionizing the clinical evaluation of this condition^{3,4}.

Meaning Of Sciatica

Sciatica pain is characterized by symptoms such as weakness, numbness, tingling sensation, and varying levels of pain. Common symptoms include lower back pain, heaviness in the legs, constant or dull pain in the hips, back, and buttocks, tingling or fiery sensation in the legs, toes, and feet, increased pain when changing body position, loss of movement, and numbness or weakness. In severe cases, individuals may experience difficulty controlling bladder or bowel

movements⁵.

Several factors can contribute to sciatica pain. The majority of cases (over 85%) are caused by herniated discs, which result from spinal disc disorders, stress, trauma, or disc herniation in the lumbar region^{6,7}. Other causes include spinal stenosis, where the narrowing of the spinal canal in the neck or lower back puts pressure on the spinal cord and nerve roots, spondylolisthesis, a condition where a vertebra slips forward and pinches the nerves, degenerative disc diseases caused by age-related or exertion-related herniation of discs, obesity, accidents, injuries, and piriformis syndrome, characterized by spasms of the small muscles beneath the larger buttock muscles, leading to irritation or compression of the sciatic nerve^{8,9}.

Yoga practices can be beneficial for individuals with sciatica pain. Yoga involves gentle stretching and progressive muscle strengthening, making it suitable for those experiencing sciatica¹⁰. Practicing specific yoga postures like gentle stretch upwards (Tadasana), sideway bending (ArdhakatiChakrasana), twisting (Kati Chakrasana), backward bending (Bhujangasana, Dhanurasana, and Makarasana), and proper gentle seated postures (Vajrasana, Vakrasana, Gomukhasana, Marjalasana, Pavanamuktasana, Matsyasana, Shavasana, Suryabhedana, and Naadishodhana Pranayama) helps maintain a healthy and flexible spine. Yoga stretches targeting the hip flexors, hamstrings, and glutes are particularly beneficial for relieving sciatica pain. As the pain subsides, it is important to strengthen other supportive muscles, including those in the pelvis, abdomen, and back. Before practicing yoga for sciatica, it is essential to consult a physician. During the acute phase or in the case of severe herniation, it may be better to rest. Generally, rest is recommended in the acute phase as it helps reduce inflammation and minimize further damage¹¹. However, once the acute phase is over, yoga practice helps accelerate the healing process and prevent future sciatica pain. It corrects spinal alignment, strengthens local muscles, and releases excessive tension in the piriformis muscle.

Do's In Sciatica Pain

1. Realign the spine: Maintaining a neutral spine position while lying on your back or standing can help alleviate pressure on the sciatic nerve. Gently curve the lower back inward while elongating from the tailbone to the crown of the head, creating space between the lumbar vertebrae with each deep breath.
2. Reset the sacrum: If you have sciatica and notice an imbalance in your pelvis or have been informed that one leg is shorter than the other, try sacral resets. These techniques aim to reposition the

sacrum, which can reduce pressure on the sciatic nerve by addressing issues related to the sacroiliac joint.

- Mobilize and extend the lower back: Engaging in gentle poses that improve the mobility of the lower back can help relieve sciatic nerve compression. Pelvic tilts while lying on your back can enhance the flexibility of the lower back, establish a neutral position, and prepare for gentle backbends. Additionally, incorporating a few standing backbends after relaxation in shavasana can promote a gentle inward curve of the lower back, particularly beneficial if sciatica arises from habitual flexion of the back.
- Stretch the gluteal and hamstrings: Tightness in the gluteal and hamstring muscles can contribute to sciatic nerve restriction and poor posture. To stretch these areas, lie on your back and draw one extended leg toward your chest. Start with a bent knee and straighten the leg only to the point where no pain is experienced. The straight leg variation stretches the entire sciatic nerve and hamstrings, while the bent knee version targets the uppermost portion of the nerve within the buttocks.
- Internally rotate the hips: The piriformis muscle, which can contribute to sciatic pain when tight, is an important external rotator. By internally rotating the hips, you can effectively stretch the piriformis muscle. Lie on your back, place a strap around one foot, extend the leg toward the ceiling, turn the toes inward, and slightly draw the leg toward the opposite shoulder.
- Externally rotate the hips: Some of the gluteal muscles in which the sciatic nerve can become entrapped are internal rotators. Performing external rotation exercises can help stretch these muscles and alleviate pressure on the nerve.

Don'ts In Sciatica Pain

- Avoid overexertion in poses: It is crucial to avoid pushing the body too far in any pose if it leads to an increase in symptoms such as pain, tingling, or numbness. Even when stretching the gluteals, hamstrings, or hips, never go beyond a point where discomfort arises.
- Avoid slouching: Rounding the lower back excessively can worsen disc and nerve problems. Maintain a neutral spine alignment, including proper alignment of the ears, shoulders, and hips. Gently curve the lower back inward while lengthening the crown of the head and the tip of the tailbone away from each other.
- Don't perform poses that strain the gluteals: Contracting the gluteal muscles excessively can increase pressure on the sciatic nerve and exacerbate pain, particularly in cases of piriformis syndrome. Avoid poses that require strong contraction of these buttock muscles, where they contract to lift the body's weight off the floor.
- Avoid excessive forward folding: Forward folds performed too deeply or rapidly can strain the sciatic nerve and worsen symptoms. This is especially true when the lumbar, gluteal, and hamstring muscles are tight. Folding forward excessively from the lower back can overstretch the lumbar muscles and cause the discs to bulge backward, increasing pressure on the sciatic nerve within the spinal canal. Start by gently hugging one knee to the chest while lying supine, and if this movement causes no pain, progress to drawing both knees toward the chest.
- Avoid twisting during discomfort: Twisting poses can be challenging when experiencing sciatica pain due to the pressure they exert on the outer parts of the intervertebral discs in the lumbar spine. Twisting combined with forward folding can be particularly problematic. Individuals with active symptoms should avoid yoga poses that involve twisting while bringing the torso close to the thighs.

Techniques Of Yoga Practices For Sciatica Pain Relief And Prevention

1. Tadasana (Mountain Pose)

Tadasana helps in improving body posture, toning muscles, enhancing blood circulation, and relieving sciatica pain. Here's how to perform Tadasana:

- Stand with feet 2 inches apart and interlock the fingers with wrists turned outwards.
- Inhale and raise the arms up, bringing them in line with the shoulders.
- Raise the heels off the floor and balance on the toes for 10-15 seconds.
- Exhale and bring the heels down, releasing the interlock of the fingers.

- Stand erect with legs together and hands hanging alongside the body.

Precautions: Avoid lifting the toes if you have acute cardiac problems, varicose veins, or vertigo.

2. Ardhakati Chakrasana (Half Waist Rotation):

Ardhakati Chakrasana helps in stretching the lower back muscles and reducing waist fat. Here's how to perform Ardhakati Chakrasana:

- Stand erect with legs slightly apart and hands hanging alongside the body.
- Slowly raise the right hand vertically above the head while breathing in.
- Bend the body towards the left side while exhaling.
- Maintain normal breathing in the final posture for about 30 seconds.
- Inhale and come up, then exhale and slowly bring the right hand down.
- Repeat the same on the other side.

3. Vajrasana (Thunderbolt Pose)

Vajrasana improves blood flow and nervous impulses in the pelvic region, strengthens pelvic muscles, and relieves sciatica pain. Here's how to perform Vajrasana¹²:

- Kneel on the floor with knees close together, and bring the big toes together while separating the heels.
- Lower the buttocks onto the inside surface of the feet with the heels touching the sides of the hips.
- Place the hands on the knees, palms facing downwards.
- Keep the back and head straight but not tense, and close the eyes to relax the body.

Precautions: Avoid this practice if you have severe pain in the knees, knee operation, or thigh operation.

4. Vakrasana (Twisted Pose)

Vakrasana helps in stretching and twisting the spine, providing relief from sciatica pain. Here's how to perform Vakrasana:

- Sit down with legs outstretched and keep the hands beside the thighs or buttocks.
- Keep the right leg straight and stretched, and place the left foot beside the right knee with the left knee raised upward.
- Inhale and raise the right arm shoulder high, keeping the elbows straight.
- Exhale and hold the left ankle with the right hand, while taking the left hand behind the back with palms on the floor.
- Look backward towards the left side and maintain the position as long as comfortable.
- Release the pose and repeat the same on the other side.

5. Ardha Matsendrasana (Half Spinal Twist)

Ardha Matsendrasana is a twisting pose that lengthens the spine and releases tension in the back. It helps in reducing sciatica pain. Here's how to perform Ardha Matsendrasana:

- Sit on the floor with legs out in front, then bend the right leg.
- Anchor the right foot on the outside edge of the left hip or thigh, while sliding the left foot to the outside edge of the right thigh.
- Put the right hand on the floor and use the fingers to support the body.
- Wrap the left arm around the right thigh and breathe in while sitting upstraight.
- Breathe out and twist a bit more, keeping normal breathing and turning the head from side to side.
- Hold the twist for up to a minute, then repeat on the other side.

6. Pavanamuktasana (Wind-Relieving Pose)

Pavanamuktasana helps in releasing sciatica pain and improving back, hip, and glute flexibility. Here's how to perform Pavanamuktasana^{13,20}:

- Lie down in a supine position with hands resting by the sides of the thighs and palms on the ground.
- Bend both knees and bring the thighs to the chest, interlocking the fingers and clasping the shin below the knees.
- Exhale and raise the head till the chin touches the knees, relaxing in this position.
- Maintain the final posture with normal breathing for at least a minute.
- Bring the head back to the ground and exhale while lowering the legs to the floor.

Precautions: Avoid this pose if you have spinal or disc injuries/damage, are in the first trimester of pregnancy, or experience knee pain. You can use a towel or strap if reaching your thigh is difficult.

8. Ardha Halasana (Half Plow Pose)

Ardha Halasana stretches the abdomen and strengthens the lower abdomen. It facilitates blood flow to the pelvic/abdominal region, benefiting sciatica pain. Here's how to perform Ardha Halasana:

- Lie down in a supine position with hands resting by the sides of the thighs and palms on the ground.
- Inhale and slowly raise both legs together without bending the knees, pausing at 30 degrees, 60 degrees, and finally raising up to a 90-degree angle.
- Keep the body from hip to shoulder straight and maintain this position as long as comfortable.
- Exhale and slowly bring down both legs to the ground without lifting the head.
- Lie on your back and bring your feet together.

Benefits: It helps reduce abdominal girth and strengthens the lower abdomen.

Precautions: Individuals suffering from spinal or disc injuries/damage should practice raising one leg at a time.

9. Matsyasana (Easy Fish Pose)

Saral Matsyasana aligns the spine, releases tension in the neck muscles, shoulders, and back, and stretches the hip flexors and muscles between the ribs. Here's how to perform Matsyasana¹⁴:

- Sit in Padmasana (Lotus Pose) and carefully bend backward, supporting the body with the arms and elbows.
- Lift the chest slightly, take the head back, and lower the crown of the head to the floor.
- Interlock the fingers of both hands and place the hands behind the head, resting the back of the head in the open palms.
- Relax the arms and the whole body, allowing the head, buttocks, and legs to support the weight of the body.
- Close the eyes and breathe slowly and deeply.
- Return to the starting position, reversing the order of movements.
- Repeat the asana with the legs crossed the other way.

Benefits: This asana stretches the intestines and abdominal organs, stimulates the muscles and organs in the abdominal region and throat area, and increases youthfulness and vitality.

Precautions: Avoid this pose if you have heart disease, peptic ulcers, hernia, back conditions, any serious illness, or if you are pregnant. People with high blood pressure or cardiac problems should also avoid this pose.

10. Bhujangasana (Cobra Pose)

Bhujangasana keeps the back healthy and strong, tones the back muscles, and helps maintain correct posture. It stretches and opens up the shoulders, chest, and abdominal muscles, and realigns the lumbar arch, reducing irritation of the sciatic nerve. Here's how to perform Bhujangasana¹⁵:

- Lie down on your abdomen with your feet wide apart and pointing outward.
- Bend both arms and place the right hand on the left hand, resting the forehead on the folded hands. This is Makarasana.
- Join both legs together, stretch the arms, and place the forehead on the ground.
- Place palms beside the chest.
- Inhale slowly, lift the chin and chest up to the navel region, maintaining normal breathing.
- Exhale and rest your forehead on the ground. Place your palms in front, one above the other, and rest your head on the palms. Spread your legs and relax.

Benefits: Bhujangasana improves spinal flexibility, strengthens the muscles in the arms and back, and is effective in relieving menstrual irregularities and constipation.

Precautions: Individuals with spinal or disc injuries/damage should avoid or practice under expert guidance. Pregnant women, people with recent abdominal surgery, or injuries in their back, arms, or shoulders should also avoid this pose. If you feel any strain or pain in your lower back, gently lower yourself down and rest before resuming.

11. Shalabhasana

Shalabhasana, also known as the Locust Pose, is a yoga posture that offers numerous benefits. It helps build core strength while working the glutes and thighs, which can enhance hip flexibility. Additionally, it strengthens the lower abdominal region and stimulates the stomach and intestines. Shalabhasana¹⁶ also targets the muscles of the upper legs, lower back, and bladder, promoting their strength and functionality.

To perform Shalabhasana

1. Lie down on your abdomen in Makarasana.
2. Rest your chin on the floor and place both hands beside your body with palms facing upwards.
3. Inhale and raise your legs off the floor as much as possible without bending your knees.
4. Extend your arms and legs to facilitate lifting your body off the floor.
5. Stay in this position for 10-20 seconds while breathing normally.
6. Exhale and bring your legs back down towards the floor, then relax in Makarasana.

Pranayama

Pranayama, the science of breath control, is an integral part of Patanjali's Ashtanga Yoga. It involves regulating and gaining control over the breath, also known as prana or life force. Pranayama encompasses three aspects of breathing: inhalation (puraka), exhalation (rechaka), and breath retention after inhalation or exhalation (kumbhaka). Regular practice of Pranayama has a calming effect on the mind, promotes homeostasis in the body and mind, reduces mental activity, and serves as a gateway to Dharana (concentration) and Meditation.

Nadishodhana Pranayama

1. Sit comfortably in any meditative posture with closed eyes and an erect spine.
2. Relax your body with a few breaths.
3. Place your left palm on your left knee in Jnana mudra and the right hand in Nasagra mudra.
4. Place your right ring and small finger on the left nostril and fold the middle and index fingers or position them between the eyebrows.
5. Close the right nostril with the right thumb and inhale slowly through the left nostril.
6. After a complete inhalation, close the left nostril with the ring finger and small finger of the right hand.
7. Open the right nostril and exhale slowly.
8. After a complete exhalation, inhale through the right nostril and fill the lungs.
9. Close the right nostril by pressing it with the right thumb.
10. Open the left nostril and exhale slowly and completely.
11. This completes one round of NadiShodhana Pranayama or Anuloma Viloma Pranayama. Repeat the same for the desired number of rounds.

Nadishodhana¹⁷ Pranayama, or Alternate Nostril Breathing, is classified as a tranquilizing pranayama and has a healing effect on the body. It soothes the nervous system, calms the mind, and helps relieve insomnia and mental tension¹⁸.

Shavasana

Shavasana, also known as the Corpse Pose, is a relaxation posture that promotes deep relaxation and rejuvenation. To practice Shavasana¹⁹, lie down on your back with your hands and legs comfortably away from your body. Let your toes point outward and keep your fingers in a semi-flexed position. Relax your head in a comfortable position and gently close your eyes

Begin with moderately deep abdominal breathing and pay attention to the flow of your breath without moving your body. Consciously relax each part of your body and release any tensions you may be holding.

Practices To Avoid In Sciatica Pain

While it is important to stay active to loosen tight muscles and promote overall well-being, certain activities and movements can exacerbate sciatica pain. It is advisable to avoid activities such as squatting, running, jumping, or any high-impact exercises. Additionally, forward bending with straight legs or engaging in seated or lying practices that require lifting both legs off the ground should be avoided.

Specific Practices To Avoid In Sciatica Pain

1. Bent over row: This weightlifting exercise can put extreme stress

- on the sciatic nerve if the back is rounded.
- Seated hamstring stretch: Bending forward to stretch the hamstring can pull and strain the sciatic nerve.
 - Forward bends: Yoga poses like downward dog, which involve bending forward from the waist, can hyperextend the back and strain the sciatic nerve.
 - Double leg lifts: Lifting both legs simultaneously while lying down can aggravate the sciatic nerve as the lower back supports the weight.
 - Squats: Full body squats exert pressure on the lower back and thighs, worsening sciatic pain.
 - Deadlifts: Straight leg deadlifts, which involve stretching the hamstrings and lower back with force, place undue stress on the sciatic nerve.
 - Abdominal stretches: Poses like cat-cow and cobra in yoga, which involve stretching the abdomen, can stress the lower back and exacerbate sciatic pain.
 - Leg circles: Swinging the leg in a full circle can suddenly strain the hamstrings, increasing sciatica pain.
 - High-impact exercises: Activities that stress the hips and pelvis, such as running, jumping, high-impact aerobics, and horseback riding, should be avoided as they can worsen sciatica pain.

In daily life, it is important to be mindful of movements and positions that may trigger sciatica symptoms. Researchers have found that symptoms often disappear temporarily but return when engaging in the same activities that initially caused the symptoms. It's worth noting that there can be a delay before experiencing pain, sometimes occurring hours after sitting, standing, or lifting.

To alleviate sciatica pain while sitting, it is recommended to choose a chair with lumbar support or place a pillow or rolled towel in the small of the back to maintain the natural curve of the spine. A swivel chair can be helpful to avoid twisting when getting up. Adjusting the height of the chair is also crucial, aiming to keep the knees and hips level to prevent excessive rounding or arching of the lower back. When sitting, focus on grounding the sitting bones, lifting through the crown of the head, gently curving the lower back, and keeping the ears over the shoulders to minimize compression on the intervertebral discs.

Standing for extended periods can also aggravate sciatica pain. Researchers suggest occasionally resting one foot (the side experiencing sciatic pain) on a yoga block, book, or small box. This relieves pressure on the symptomatic side and restores a slight curve to the lumbar spine, relieving pressure on all lumbar nerve roots.

When lifting heavy objects, it is important to distribute the effort to the legs rather than the lower back. Bend the knees, keep the back straight with a gentle curve in the lower back, and hold the load close to the body. If an object is too heavy, it is advisable to seek assistance to lift it and avoid lifting and twisting simultaneously.

In addition to a mindful yoga practice, incorporating these everyday actions into a self-treatment protocol can help alleviate sciatica symptoms.

Research findings strongly support the use of yoga therapy for lower back conditions, including sciatica. Studies have shown that specific yoga poses can relieve pain, tenderness, and stiffness associated with sciatica. Cobra pose and Locust pose, in particular, have been found to be beneficial. Yoga has also been found to reduce the frequency of lower backaches and decrease the need for medication for back pain.

Systematic reviews and meta-analyses have concluded that yoga treatment is effective for chronic low back pain. Even for patients diagnosed with a herniated disc and resulting sciatica, yoga has shown to significantly improve scores and reduce disability.

CONCLUSION

In conclusion, scientific evidence confirms that yoga is an effective treatment and preventive measure for sciatica pain and other forms of back pain. Incorporating yoga into daily life, alongside standard medical treatment, can help restore a healthy balance to the muscles of the body. It is recommended that individuals with lower back pain, including sciatica, consider practicing yoga as part of their overall wellness routine.

REFERENCES

- Ansari R, Dadbakhsh A, Hasani F, Hosseinzadeh F, Abolhassanzadeh Z, Zarshenas MM.

- Traditional Aspects of Sciatic Pain Management and Allied Therapies from Persian Medical Reports. *Curr Drug Discov Technol*. 2021;18(2):194-206. doi: 10.2174/1570163817666200316112120. PMID: 32178615.
- Boni T, Benini A, Dvorak J, Domenico Felice Antonio Cotugno. *Spine (Phila Pa 1976)*. 1994;19(15):1767-70.
- Parisien RC, Ball PA. William Jason Mixer (1880-1958). Ushering in the "dynasty of the disc". *Spine (Phila Pa 1976)*. 1998 Nov 1;23(21):2363-6. doi: 10.1097/00007632-199811010-00024. PMID: 9820919.
- Hashemi M, Halabchi F. Changing Concept of Sciatica: A Historical Overview. *Iran Red Crescent Med J*. 2016 Feb 6;18(2):e21132. doi: 10.5812/ircmj.21132. PMID: 27175300; PMCID: PMC4863142.
- Davis D, Maini K, Vasudevan A. Sciatica. [Updated 2022 May 6]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2023 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK507908/>
- Koes BW, van Tulder MW, Peul WC. Diagnosis and treatment of sciatica. *BMJ*. 2007 Jun 23;334(7607):1313-7. doi: 10.1136/bmj.39223.428495.BE. PMID: 17585160; PMCID: PMC1895638.
- Schroeder GD, Kurd MF, Vaccaro AR. Lumbar Spinal Stenosis: How Is It Classified? *J Am Acad Orthop Surg*. 2016 Dec;24(12):843-852.
- Raja A, Hoang S, Patel P, et al. Spinal Stenosis. [Updated 2022 Jul 17]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2023 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK441989/>
- Donnelly III CJ, Hanna A, Varacallo M. Lumbar Degenerative Disk Disease. [Updated 2023 Apr 1]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2023 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK448134/>
- Sherman KJ, Cherkin DC, Cook AJ, Hawkes RJ, Deyo RA, Wellman R, Khalsa PS. Comparison of yoga versus stretching for chronic low back pain: protocol for the Yoga Exercise Self-care (YES) trial. *Trials*. 2010 Mar 31;11:36. doi: 10.1186/1745-6215-11-36. PMID: 20356395; PMCID: PMC2864260.
- Sharrak S, Al Khalili Y. Cervical Disc Herniation. [Updated 2022 Aug 29]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2023 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK546618/>
- Vajrasana- In Gherand Samhita written by Gherand Maharshi, Chapter-2, shloka-13, and In Hatha Yoga Pradipika written by Swami Swatmaaram, Chapter-1, Shlok-39.
- Pavanamuktasana- Citation: Selvarajah K, Arumugam K (2017) Improvement of Early Arthritic Symptoms with Pawanmuktasana Anti-Rheumatic Series. *MOJ YogaPhysical Ther* 2(2): 00018.
- Matsyasana- In Gherand Samhita written by Gherand Maharshi, Chapter-2, shloka4.and 22.
- Bhujangasana- In Gherand Samhita written by Gherand Maharshi, Chapter-2, shloka-42, 43.
- Shalabha- In Gherand Samhita written by Gherand Maharshi, Chapter-2, shloka-39.
- Naadishodhana- In Gherand Samhita written by Gherand Maharshi, Chapter-5, shloka 34, and In Hatha Yoga Pradipika written by Swami Swatmaaram, Chapter- 2, Shlok-7, 8,9.
- Sinha AN, Deepak D, Gusain VS. Assessment of the effects of pranayama/alternate nostril breathing on the parasympathetic nervous system in young adults. *J Clin Diagn Res*. 2013 May;7(5):821-3. doi: 10.7860/JCDR/2013/4750.2948. Epub 2013 May 1. PMID: 23814719; PMCID: PMC3681046.
- Shavasana- In Gherand Samhita written by Gherand Maharshi, Chapter-2, shloka-20, and In Hatha Yoga Pradipika written by Swami Swatmaaram, Chapter-1, Shlok-34
- Efficacy of Yogasana in the Management of Grudhrasi (Sciatica) February 2019 *World Journal of Pharmaceutical Research* volume8(issue 2):1414-1421 DOI:10.20959/wjpr20192-14229