



# A Study on the effectiveness of Suboccipital Distant Myofascial Release Technique Along with Static Stretching on Hamstring Flexibility among young Adults

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## Abstract

**Background:** This study evaluates the impact of the suboccipital distant myofascial release technique, along with static stretching, on hamstring flexibility among young adults.

**Methods:** A total of 20 young adults (n=20) with documented hamstring tightness were randomly recruited for the study. Participants completed a structured intervention comprising suboccipital distant myofascial release technique along with static stretching. Hamstring tightness was assessed pre and post intervention by the Sit and Reach Test.

**Results:** Statistical evaluation using a paired t test demonstrated a significant hamstring flexibility. The calculated t value exceeded the critical threshold of 2.860 at the 0.005 level, confirming that the observed enhancement was statistically reliable. These findings indicate that both the suboccipital distant myofascial release technique, along with static stretching, on hamstring flexibility among young adults.

**Conclusion:** The study aimed to find out the effect of the suboccipital distant myofascial release technique, along with static stretching, on hamstring flexibility among young individuals. In this study, 20 subjects with hamstring tightness at the age of 18-25 years were selected and received the suboccipital distant myofascial technique along with static stretching for 3 sessions per week for 2 weeks. From the results, this study concluded that the suboccipital distant myofascial release technique, along with static stretching, has got beneficial effect in treating hamstring tightness among young adults.

**Key words:** Hamstring Flexibility, Suboccipital Distant Myofascial Release, Static Stretching, Sit And Reach Test.

## I. Introduction

Skeletal muscles are soft tissues that help us move and maintain good posture, both of which are important for overall physical health. When our muscles are flexible, we can move more freely and are less likely to experience sprains or strains. To stay healthy, muscles need to stay active and able to stretch properly. If we spend long periods being inactive, our muscles can become tight because they aren't being used enough.[1]

The hamstrings are a group of three muscles located at the back of the thigh: the semitendinosus, semimembranosus, and biceps femoris. These muscles play a key role in bending the knee and extending the hip, which

makes them essential for everyday movements like walking, running, jumping, and squatting. Keeping the hamstrings flexible is important because it helps maintain a healthy range of motion and reduces the risk of injury.[2]

Maintaining proper hamstring flexibility is important for preventing injuries, improving posture, and supporting better athletic performance. When the hamstrings become tight, they can limit the range of motion, increase the risk of muscle strains, and even contribute to lower back pain by altering normal movement patterns. Regular stretching helps reduce tightness, encourages the muscles to lengthen, and improves overall flexibility.[3]

The hamstring muscles, particularly the biceps femoris, play a crucial role in maintaining an upright trunk position when rising from a stooped posture by counteracting gravitational forces. During ambulation, the hamstrings control the rate of knee extension, thereby protecting the hip and knee joints from injury. Additionally, the hamstring muscles contribute to postural stability by providing support during abduction and adduction movements, which helps to maintain balance. [4]

Including hamstring flexibility exercises in a regular fitness routine can enhance both dynamic and static range of motion, promote proper posture and support long term health and performance. Stretching programs should combine dynamic stretches prior to physical activity with static stretches after exercise to ensure balanced flexibility and muscular strength. [5]

Stretching and strengthening the hamstrings not only help reduce the risk of injury but also support better lower-body function, balance, and coordination. Regular flexibility training using both dynamic and static stretching techniques is important for anyone who wants to enhance their physical performance and move more efficiently in everyday life. [6]

Myofascial release is a hands-on therapeutic approach aimed at easing tension within the fascia and muscles. It works by addressing fascial restrictions that may lead to pain, discomfort, and limited movement, especially in chronic conditions such as nonspecific low back pain. Through the application of gentle, sustained pressure on targeted areas, this technique helps reduce tightness, enhance tissue flexibility and improve overall functional movement.[7]

The suboccipital muscles contain the highest density of muscle spindle fibers, they are thought to play a significant role in maintaining head posture control due to its proprioceptor monitoring ability. 8

There is increasing evidence supporting morphological continuity among skeletal muscles, with fascia acting as a connecting structure. Several studies emphasize this myofascial continuity between anatomically distant regions. Among the various myofascial chains, the superficial back line has been frequently identified in multiple experimental studies conducted on human cadavers. [9]

Myofascial release is a commonly used manual therapy technique for the treatment of myofascial pain and tightness. It involves the application of gentle, sustained pressure to areas of fascial restriction with the aim of reducing tension, enhancing circulation, and restoring normal musculoskeletal function. This technique is effective in managing both acute and chronic neck pain by decreasing pain levels, improving range of motion, and facilitating tissue healing. Myofascial release is a hands-on massage technique that focuses on stretching the fascia and releasing adhesions between the fascia and surrounding structures such as the skin, muscles, and bones. The primary aim of this technique is to reduce pain, enhance range of motion, and promote over all body balance. Myofascial release specifically targets restrictions within the deeper layers of the fascia to restore normal tissue mobility. By normalizing tissue function, myofascial release contributes to pain reduction, improved mobility, and facilitation of the self-healing mechanisms of body. [10]

## II. Materials and Methods

### A. Study Design

A pre-post experimental study was carried out at R.V.S. College of Physiotherapy, Sulur, Coimbatore, to evaluate the effectiveness of the suboccipital distant myofascial release technique, along with static stretching, on hamstring flexibility among young adults.

### B. Subjects:

Twenty young adults (n=20) with hamstring tightness were selected for the study including (1) Age group between 18 to 25 years, (2) Clinically diagnosed with hamstring tightness, (3) Both sex- male and females, (4) Subjects with complaints of movement restriction, (5) Shortened length of muscle. And excluding (1) Spinal injuries and Trauma, (2) Pregnancy, (3) Recent surgery, (4) Any cervical spine conditions (cervical instability, fracture), (5) Acute infection, Neurological disorder.

### C. Methods:

Ethically cleared. Twenty young adults participated in the study and received interventions consisting of suboccipital distant myofascial release technique, along with static stretching. The training program was administered over a two week period, with a frequency of three sessions per week Hamstring flexibility was assessed using the sit and reach test and active knee extension test both prior to and following the intervention.

### D. Description of the intervention:

The suboccipital distant myofascial release technique, along with static stretching to improve hamstring flexibility,

Sub occipital distant myofascial release technique:

The patient was positioned in a supine lying posture with the legs extended. The therapist stood at the head end of the examination couch and placed the fingertips on the posterior aspect of the upper cervical vertebrae. A gentle stretch was applied in a downward direction, progressing from the occipital region toward the sub-occipital area. The mobilization was performed for approximately two minutes, repeated five times, with a 30 second rest between each repetition. The intervention was scheduled three times per week over a two week period.



Figure 1: Suboccipital myofascial release technique.

### Static stretching for hamstring:

The patient was positioned in supine lying while the therapist stood nearby to assist. As a warm up, the patient performed ten repetitions of straight leg raises. Static stretching was then conducted with the participant lying supine, head in neutral alignment, and arms resting by the sides. Straps were applied to stabilize the pelvis and the contralateral limb. The hip and knee of the working limb were passively flexed to 90°, after which the knee was gradually extended until maximal resistance was reached. This stretch was maintained for 30 seconds, followed by a 15 second rest before repeating. The protocol was administered three times per week over a two week period.



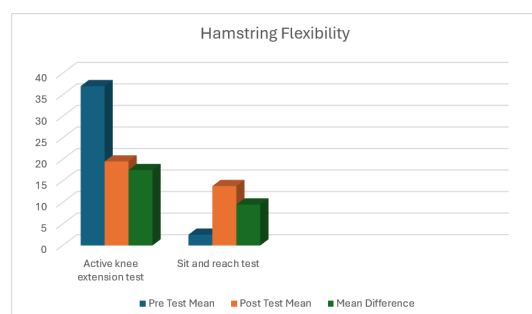
Figure 2: Static stretching of hamstring.

### III. Data Analysis and Results

The study aimed to examine the effectiveness of the suboccipital distant myofascial release technique, along with static stretching to improve hamstring flexibility among young adults. Statistical analysis revealed a calculated t value was compared with a critical t value of 2.860 at the 0.005 level of significance. As the calculated value exceeded the table value, the findings indicate a statistically significant improvement hamstring flexibility following the intervention.

| Variables                  | Pre Test Mean | Post Test Mean | Mean Difference | Standard Deviation | Paired 't' Value |
|----------------------------|---------------|----------------|-----------------|--------------------|------------------|
| Active knee extension test | 37            | 19.5           | 17.5            | 2.56               | 30.42            |
| Sit and reach test         | 10.8          | 16.2           | 5.4             | 1.46               | 16.56            |

.005 level of significance



### IV. Discussion

The present study showed that therapist-administered interventions significantly improved hamstring flexibility in all three groups. The combination of static stretching and remote myofascial release produced greater improvement than either technique alone. Adequate hamstring flexibility was important for normal spine and lower limb movement, and reduced flexibility could increase musculoskeletal stress. Static stretching has been reported as an effective method to improve hamstring flexibility, possibly by increasing stretch tolerance and reducing muscle stiffness. Myofascial release has been reported to produce several effects, including reduction of delayed onset muscle soreness, pain reduction, modulation of autonomic nervous system

activity and increased flexibility. The effects of myofascial release were commonly explained through neurophysiological mechanisms, bioelectric models, increased viscoelasticity, thixotropic properties and piezoelectric effects. Myofascial release has been shown to improve flexibility through neurophysiological and fascial mechanisms. The improvement seen with remote myofascial release in this study could be explained by force transmission through the superficial back line. Although differences between groups were not statistically significant, all groups showed clinically meaningful improvement in knee extension angle. Greater improvement in the combination group may have been due to a larger treatment area and longer intervention durations. Therapist-administered techniques were more effective than self-administered interventions, possibly due to better adherence.

### V. Conclusion

Suboccipital distant myofascial release technique and static stretching produced a significant improvement in hamstring flexibility among young adults. The experimental group underwent training for a duration of two weeks. Based on the findings, the study concludes that these exercises are effective in enhancing hamstring flexibility in young adults. This study was carried out with only a small group of participants. It was conducted within a fixed time frame, and the focus was specifically on young adults between the ages of 18 and 25.

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