

# A comparative efficacy of nerve mobilization combine with hamstring stretching on pain and functional outcome in individual with hamstring tightness

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## ABSTRACT

**Background:** Hamstring tightness is a common musculoskeletal condition seen in both active and sedentary individuals, leading to pain, reduced flexibility, and decreased functional performance. Physiotherapy interventions such as foam rolling and neural mobilization are frequently combined with stretching to improve hamstring flexibility and lower limb function.

### Methods

A comparative experimental study was conducted on 70 participants with hamstring tightness. Subjects were randomly divided into two groups with 35 participants in each group.

- **Group A:** Hamstring stretching combined with foam roller
- **Group B:** Hamstring stretching combined with neural mobilization

The intervention was administered 3 sessions per week for 4 weeks. Outcome measures included Visual Analogue Scale (VAS), Active Knee Extension Test (AKE), Sit and Reach Test, and Lower Extremity Functional Scale (LEFS). Assessments were recorded before and after treatment.

**Results:** Both groups showed significant improvement in pain, hamstring flexibility, and functional outcomes after intervention. Group B demonstrated greater improvement compared to Group A in VAS, AKE, Sit and Reach Test, and LEFS scores.

**Conclusion:** Hamstring stretching combined with neural mobilization was more effective than hamstring stretching combined with foam roller in improving pain, flexibility, and functional outcome in individuals with hamstring tightness.

**Keywords:** Hamstring Tightness, Neural Mobilization, Foam Roller, Stretching, Flexibility, Functional Outcome, Physiotherapy

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## INTRODUCTION

Hamstring tightness is a frequently observed musculoskeletal condition affecting athletes, students, office workers, and sedentary individuals. Tight hamstring muscles can restrict hip and knee mobility, alter pelvic posture, contribute to low back pain, and decrease functional performance. Reduced hamstring flexibility may also increase the risk of lower limb injuries and affect daily activities such as walking, bending, running, and stair climbing.

Stretching is one of the most commonly used physiotherapy interventions to improve hamstring flexibility and reduce muscle stiffness. Foam rolling is another technique widely used for myofascial release, which helps improve tissue extensibility and circulation. Neural mobilization is a neurodynamic technique that improves the mobility of neural tissues and reduces neural mechanosensitivity, thereby enhancing flexibility and reducing pain.

Although both foam rolling and neural mobilization are commonly used with stretching, limited studies have compared their effectiveness in individuals with hamstring

tightness. Therefore, this study was conducted to compare the efficacy of hamstring stretching combined with foam rolling and hamstring stretching combined with neural mobilization on pain and functional outcomes.

## METHODOLOGY

### Study Design

Comparative experimental study.

### Study Setting

The study was conducted in the local community settings .

### Sample Size

Total sample size: 70 participants

- Group A = 35 participants
- Group B = 35 participants

### Sampling Method

Convenient sampling with random allocation into two groups.

### Study Duration

4 weeks.

### Intervention Protocol

**Group A – Hamstring Stretching + Foam Roller**

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Participants performed static hamstring stretching followed by foam rolling exercises for the hamstring muscles.

**Group B – Hamstring Stretching + Neural Mobilization**  
Participants performed static hamstring stretching along with sciatic nerve mobilization techniques .

**Frequency of Treatment**

3 sessions per week for 4 weeks.

**Outcome Measures**

- Visual Analogue Scale (VAS)
- Active Knee Extension Test (AKE)
- Sit and Reach Test
- Lower Extremity Functional Scale (LEFS)

**Statistical Analysis**

Data were analyzed using paired and unpaired t-tests. Statistical significance was set at  $p < 0.05$ .

**Inclusion Criteria**

- Age group between 18–35 years
- Both male and female participants
- Individuals with hamstring tightness
- Willingness to participate in the study

**Exclusion Criteria**

- Acute hamstring injury
- Neurological disorders
- Systemic musculoskeletal disorders
- Participants undergoing other physiotherapy treatment

**Ethical Committee Approval**

The approval for this study is gained from the Institutional Ethics Committee of Krishna Vishwa Vidyapeeth (Deemed to be University), Karad. Respondents were given a detailed explanation about the study which is to be conducted and inform consent was collected from each and every participant participating in this study. There was a volunteer involvement of all the respondents in this study whose confidentiality was thoroughly maintained

**RESULTS**

Both Group A and Group B showed improvement following intervention. Group B showed greater improvement in pain reduction, hamstring flexibility, and lower extremity functional performance compared to Group A.

**Table 1: Demographic Data**

Variables	Group A (n=35)	Group B (n=35)
Mean Age	24.3 ± 3.2 years	23.9 ± 3.5 years
Male	18	17
Female	17	18

**Table 2: Comparison of Outcome Measures**

Outcome Measure	Group A Pre	Group A Post	Group B Pre	Group B Post
VAS	6.2 ± 0.9	4.8 ± 1.0	6.1 ± 1.0	3.6 ± 0.9
AKE (degrees)	55.4 ± 5.8	41.2 ± 6.1	54.9 ± 5.6	32.8 ± 5.4
Sit and Reach (cm)	10.1 ± 2.5	13.0 ± 2.8	10.3 ± 2.7	15.8 ± 3.1
LEFS	48.5 ± 4.9	54.1 ± 5.1	49.0 ± 5.0	58.2 ± 5.3

**DISCUSSION**

The present study compared the effectiveness of hamstring stretching combined with foam rolling and hamstring stretching combined with neural mobilization in individuals with hamstring tightness. Both groups demonstrated significant improvement in pain, flexibility, and functional outcomes following intervention.

Group A showed improvement due to the effects of static stretching and myofascial release produced by foam rolling, which may improve circulation, reduce muscle stiffness, and increase tissue extensibility.

However, Group B demonstrated greater improvement compared to Group A. Neural mobilization may improve the mobility of the sciatic nerve, reduce neural tension, and decrease mechanosensitivity, thereby allowing greater flexibility gains and reduction in pain. Improved neural mobility may also contribute to better functional performance.

The findings of this study are consistent with previous studies that reported positive effects of neural mobilization on hamstring flexibility and lower limb function.

**LIMITATIONS**

The study had some limitations. The sample size was limited to 70 participants and convenience sampling may have introduced bias. The study duration was only 4 weeks, so long-term effects could not be assessed. As the study was conducted in a single setting, the findings may not be generalizable to a larger population. Future studies with larger sample sizes and longer follow-up are recommended .

**CONCLUSION**

Both hamstring stretching combined with foam rolling and hamstring stretching combined with neural mobilization were effective in improving pain, hamstring flexibility, and functional outcomes in individuals with hamstring tightness. However, hamstring stretching combined with neural mobilization showed superior improvement compared to hamstring stretching combined with foam rolling.

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