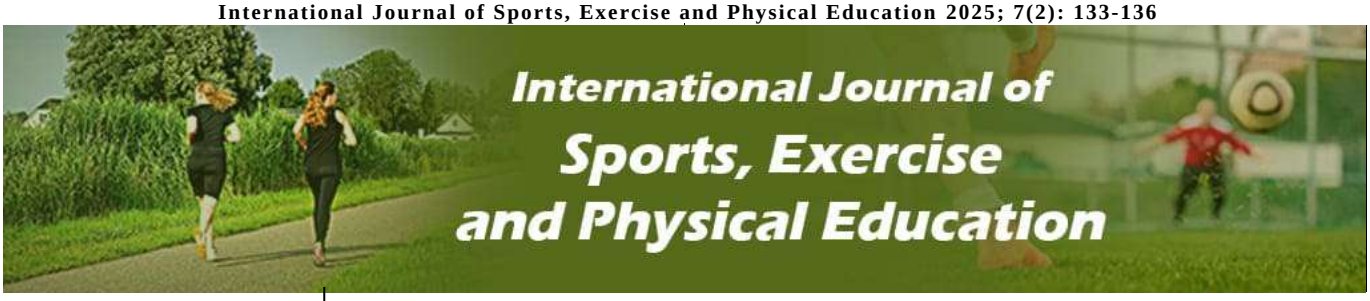

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Immediate effect of sciatic nerve sliders on hamstring length and lumbar flexion range of motion among college students

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Abstract
Introduction: In modern sedentary lifestyle particularly among college students who are sitting for prolonged period and reduced physical activity lead to tightness of hamstring muscles and reduced lumbar flexion range of motion
Sciatic nerve is the largest and longest nerve in the body which play an crucial role in lower limb movement. When the nerve is compressed it can lead to pain and reduced mobility which can lead to tight hamstring and reduced lumbar flexion
Aim: The study aimed to compare the change in hamstring muscle length and lumbar flexion range, before and after the sciatic nerve slider intervention.
Objective: The objective of this study is to investigate the immediate impact of performing sciatic nerve slider exercise on lumbar flexion range and hamstring muscle length.
Specifically, to evaluate whether these sciatic nerve slider techniques can increase hamstring length and improve the lumbar flexion ROM immediately after the exercises are performed.
Method: The interventional study include a total participant of 50 college students between age group of (18-24) with mild to moderate hamstring tightness. The participants were underwent baseline assessment of hamstring length by popliteal angel method and lumbar flexion range of motion by modified modified schobers test, following the base line assessment the participant performed single set of sciatic nerve sliders (20-reputations). Post intervention measurements was immediately taken to assess the change in hamstring length and lumbar flexion range of motion
Conclusion: The study concludes that "two end of proximal and distal sciatic nerve sliders have significant impact on increasing hamstring length and lumbar flexion range of motion among college students.

Keywords: Sciatic nerve sliders, hamstring length, lumbar flexion

Introduction
In modern sedentary lifestyle, particularly among college students who are sitting for a prolonged period and reduced physical activity lead to the tightness of hamstring muscle and reduction in lumbar flexion range of motion.
Limited hamstring flexibility and lumbar range motion restriction are closely related to the tension in the sciatic nerve. These limitations in lumbar flexion and hamstring tightness can significantly affect the college student's physical performance and can contribute to pain and discomfort during lifting, bending and athletic activity.
Tightness in hamstring can limit the lumbar flexion range of motion in the posterior chain [the interconnected muscles and tissue from lower backdown to the leg]. When hamstring muscles are tight, they pull on the pelvis which reduces the lumbar flexion.
Sciatic nerve sliders are also known as sciatic nerve glides or mobilizations, are a therapeutic exercise technique designed to improve sciatic nerve mobility within its surrounding tissues. They involve controlled, rhythmic movements of the leg, hip, and foot to mobilize the sciatic nerve without stretching it excessively. This exercise is commonly used to reduce neural tension, enhance flexibility, and improve range of motion in individuals experiencing nerve-related restrictions, such as tight hamstrings and limited lumbar flexion.

Materials and Methods

Materials

Pen
Paper
Consent form
Inch tape
Goniometer
Mat
Couch
Pillow

Methodology

Study setting

This study was conducted at college of physiotherapy SRIPMS, Coimbatore, Tamil Nadu. Under the supervision of staff of college of physiotherapy.

Study Design

This study was conducted as experimental pre- test and post- test study design.

Selection Criteria

Inclusion criteria

Males
Age group 18-24
Mild to severe hamstring tightness
Anyone having minimum 20 degree of knee flexion measured by goniometer using popliteal angle method
Leg dominance was ascertained by asking the question "if you would shoot a ball on a target, which leg would you use to shoot the ball?"

Exclusion criteria

Neurological issues
Musculoskeletal issues
Deformity
Indulged any form of sports
Autoimmune disorder
Communicable disease

Sample Size

A total subject of 65 was selected. 15 were excluded for various reasons and 50 were selected according to inclusion criteria.

Sample Format

Convenient sampling method.

Description of Technique

Popliteal angle method.
Modified modified Schober's test.

Study Duration

3 months

Duration of Intervention

The intervention was given for single session for one time with total duration of 10 minutes.

Variables

Independent variable
Neurodynamic sciatic nerve sliding technique
Dependent variable
Hamstring flexibility
Lumbar flexion range of motion

Procedure

Patient position: long sitting
Therapist position: standing next to the patient

Procedure

The subject was seated in a long sitting position, with the head in neutral position and hands held behind the back. A pillow was kept under the knee. The subject was asked to slouch from his or her thoracic spine. Sliders performed involved a single set of neck flexion with ankle plantar flexion and neck extension with ankle dorsiflexion for 20 repetitions, a pillow was kept under the knee to relax the hamstring and allow the movement from the cervical spine and ankle joint only, thereby ensuring that there is no direct movement at lumbar spine and hamstring area which are to be assessed post the intervention.

Assesment Tool

Modified modified Schober's test
Popliteal angle method

Statistic Tools

The study is conducted as a pre test and post test design with multivariate format. The "t" test is used to analyze the variables.

Paired "t" test

To verify the difference within each group between pre and post parameter, paired "t" test is used.
The "t" value is calculated using the formula

$$S = \sqrt{\frac{\sum d^2 - \overline{(d)}^2 n}{n-1}}$$

$$t = \frac{\overline{d}\sqrt{n}}{s}$$

Results

Data Analysis and Interpretation

The calculations were tabulated for easier statistical calculations and better comprehension. The pre test and post test values of hamstring length was obtained using popliteal angle method and lumbar flexion range of motion was assessed using modified modified Schober's test.

Modified modified schobers test data

Test	Mean	Standard Deviation
Pre-Test	3.758	0.363
Post-Test	4.334	0.496

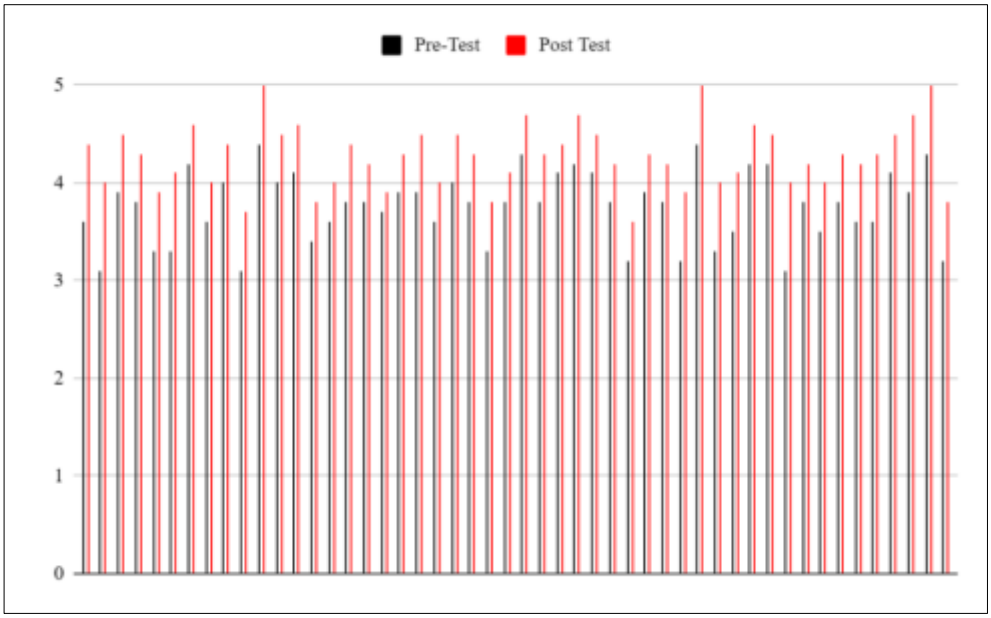

Fig 1: Modified modified schobers test data

Popliteal Angle Test Data

Test	Mean	Standard Deviation
Pre-Test	132.28	11.15
Post Test	137.90	10.73

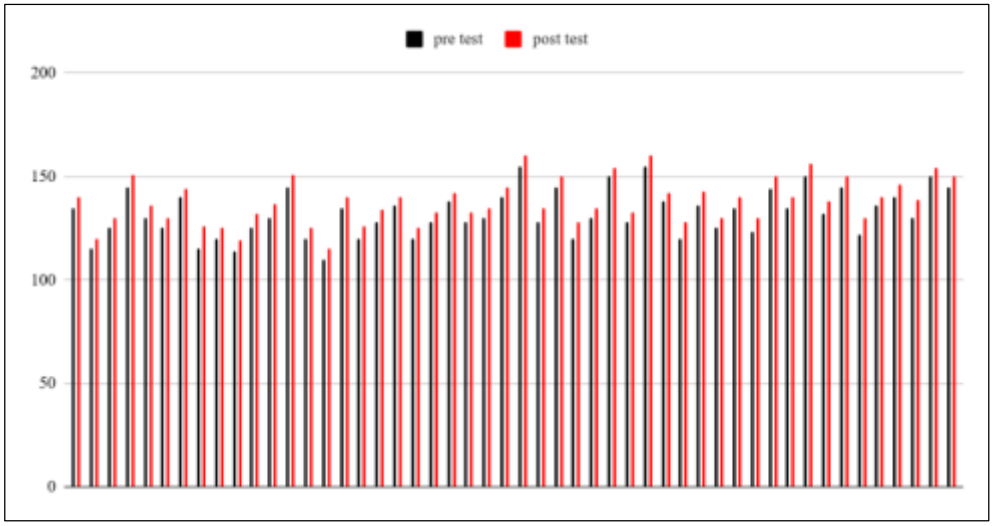

Fig 2: Popiletal angle method test data

Discussion

The purpose of this study is to determine "The immediate effects of sciatic nerve sliders on hamstring length and lumbar flexion range of motion (ROM) among college students" the study was conducted out for a period of 3 months with 49 degree of freedom.

Literature review states that, the pilot study conducted by Méndez-Sánchez et al. [12] In their study, they found that on performing sciatic nerve slider technique as an adjunct to sustained hamstring stretching, there was an immediate improvement in the lower quadrant flexibility in young healthy soccer players. This occurs as neural mobilization relieves the tension and pressure in the nearby muscles, resulting in improvement in movement. Nerve sliders are known to reduce the mechanosensitivity of the neural tissue, thereby decreasing the extraneural interface. It, thus, assists in preventing the adhesions between nerve and surrounding tissue and also improves the viscoelasticity of the tissue that contributes to increased flexibility. The authors hypothesized that the neurodynamic sliders decreased the neuromeningeal sensitivity. According to the authors, the significance of neuromeningeal mechanosensitivity in the etiology of hamstring injury has shown clinically as positive neural tension sign.

The results in various parameters were compared. In modified modified Schober's 15 members have minimal improvement, 8 members have maximum improvement and rest of all have average improvement. The standard deviation is 0.48617 and "t" value is 8.34 at 0.05 level of significance, the mean value of pre test is 3.758 and post test is 4.334.

In popliteal angle method 18 members have minimal improvement, 6 members have maximal improvement and rest of all have average improvement.

Conclusion

The findings of this study showed that a single session of sciatic nerve sliding technique significantly improves the hamstring length and lumbar flexion range of motion.

The study concludes that "Two end of proximal and distal sciatic nerve slider had significant impact on increasing the hamstring length and lumbar flexion range of motion among college students"

Acknowledgments

Consent Form

I voluntary agree to participate and provide my fullest consent and cooperation for the research work of registration no, entitled as 'Immediate effect of sciatic nerve sliders on hamstring length and lumbar flexion range of motion among college students'. I was explained about the procedure of the study and I understood the requirements and benefits of the study.

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