



# EFFECT OF PROPRIOCEPTIVE NEUROMUSCULAR FACILITATION STRETCHING ON FLEXIBILITY IN HAMSTRING TIGHTNESS

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## **Abstract:**

**BACKGROUND:** Many people suffer with tight Hamstring. Tight Hamstring can also be responsible for postural problems and other back problems as they will tend to pull pelvic out of normal position. Hamstring tightness can be caused by genetic reason. Children born with naturally short Hamstring when some people are naturally supple, not enough stretching, problems in the lower back can put pressure on the sciatic nerve which runs down the leg and causes muscles to tighten. **OBJECTIVE:** To find out the effectiveness of Proprioceptive Neuromuscular Facilitation (PNF) stretching on flexibility of Hamstring tightness.

**METHODOLOGY:** This study was conducted in Division of Physical Medicine and Rehabilitation, Rajah Muthiah Medical College and hospital, Annamalai University. 30 Male subjects were selected for this study. The technique of Proprioceptive Neuromuscular Facilitation (PNF) stretching (contract Relax method) was applied as the treatment programme. The subject were assessed for the range of motion of knee joint before the application of technique. Treatment was given 2 sessions a day using contract relax technique with help of Stretch Out Strap (SOS) band maintaining the knee in extension for 15 to 20 second. This treatment was repeated for 4 days. After the final day treatment the subject was reevaluated for the knee joint range of motion at the end of session.

**RESULT:** The Proprioceptive Neuromuscular Facilitation (PNF) stretching technique has been effective in decreasing Hamstring tightness. The improvement was statistically significant at  $p < 0.001$ . So, this study shows that there was significant improvement in the range of motion in both legs after the treatment.

**CONCLUSION :** Based on the results, the study conclude that the Proprioceptive Neuromuscular Facilitation (PNF) techniques (contract Relax method) is effective in relieving Hamstring tightness. All the 30 subjects were shown a significant improvement in increasing range of motion and extension of knee joint.

**KEY WORDS:** Hamstring tightness, Proprioceptive Neuromuscular Facilitation (PNF), Contract Relax Method, Stretch Out Strap, Range of Motion

## **I. INTRODUCTION**

Tightness is a non-specific term referring to mild shorting of an otherwise healthy musculo tendinous unit. Normal Individual who do not regularly participate in a flexibility program can develop tightness. Particularly in two joint muscles such as Hamstring. The Hamstring are a group of muscles in the posterior aspect of thigh, composed of semitendinosus, semimembranosus, biceps femoris and Hamstring part of adductor Magnus. The action is flexion of knee and extensor of hip.

Many people suffer with tight hamstring. Tight hamstring can also be responsible for postural problems and other back problems as they will tend to pull the pelvic out of normal position. Hamstring tightness can be caused by genetic reason. Children born with naturally short hamstring when some people are naturally supple, not enough stretching, problems in the lower back can put pressure on the sciatic nerve which runs down the leg and causes muscles to tighten.

So this makes the need to find out the effect of Proprioceptive Neuromuscular Facilitation (PNF) stretching on Hamstring tightness

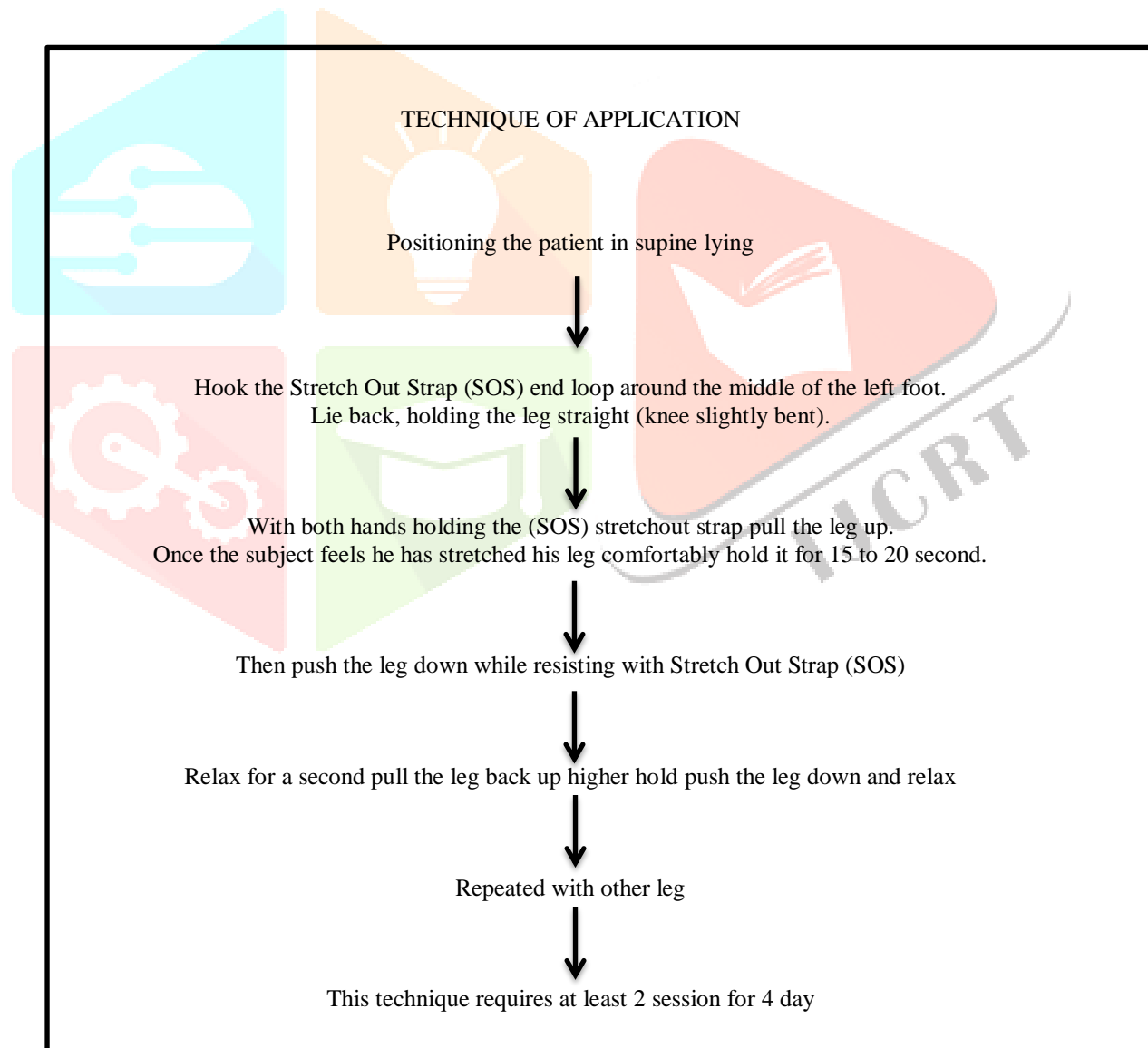
## II. METHODOLOGY

It is an Quasi Experimental Study. It was conducted in division of physical medicine and rehabilitation, Rajah Muthiah Medical College and Hospital, Annamalai University. 30 male subjects with hamstring tightness were selected on the basis of the under lying selection criteria. Subjects included in study were males, the age group between 18-25 years, subjects who had a positive result in active knee extension test were selected. Universal Goniometer and Stretch Out Strap (SOS) band were used for this study. 30 male subjects with hamstring tightness were selected by active knee extension test. These subjects were treated with Proprioceptive Neuromuscular Facilitation (PNF) technique (contact relax method) with the help of Stretch Out Strap (SOS) band for 2 sessions a day and for 4 days. The subjects was positioned in supine lying with hip flexed 90° and knee also flexed. Pre treatment and post treatment evolution for knee extension range of motion in above position fixed axis on lateral condyle of femur was done. The technique was applied with the help of stretch out strap (SOS) band and the subject was instructed to extend his leg with the band as for as it stretches for 15 to 20 seconds. After 4 days of treatment to joint extension was re-evaluated at the end of session.

### TEST FOR HAMSTRING TIGHTNESS

#### Active Knee Extension Test

<b>Position</b>	:	Patient in supine lying
<b>Procedure</b>	:	The patients hip is flexed to 90° and knee also flexed. Then extend the knee actively by maintain hip in 90° degree flexion.
<b>Clinical Significance</b>	:	For Patients with hamstring tightness, their knee extention will be limited and they will experience pain in back of thigh.

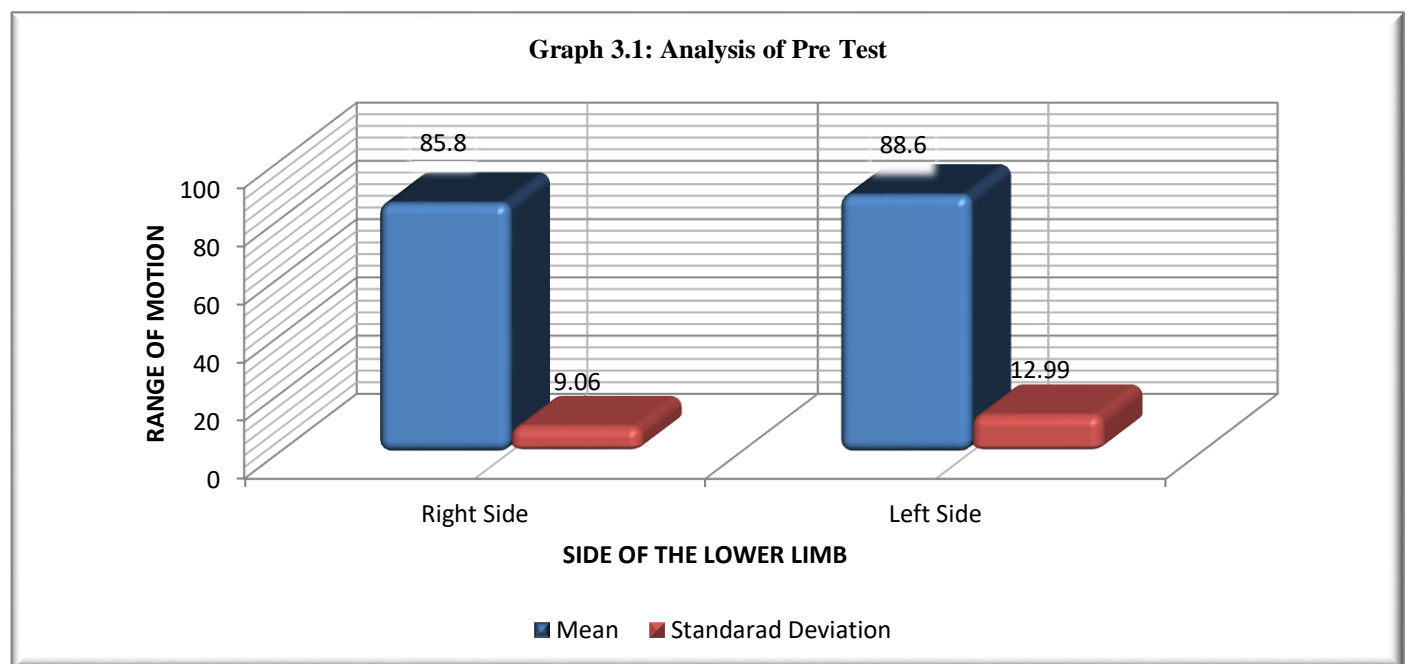


### III. RESULT

The average range of motion before treatment in right leg was 85.8°. The minimum range of motion was 75° and the maximum range of motion was 105°. After the treatment the average range of motion in right leg was 114.6°. The average range of motion before treatment in left leg was 88.6°. The minimum range of motion was 65° and maximum range of motion was 115°. After the treatment the average range of motion in left leg was 115.9°. The average improvement was 28.5° in right leg. The average improvement was 27.2° in left leg. The improvement was statistically significant at  $p < 0.001$ . So this shows that there was significant improvement in the range of motion in both legs after the treatment.

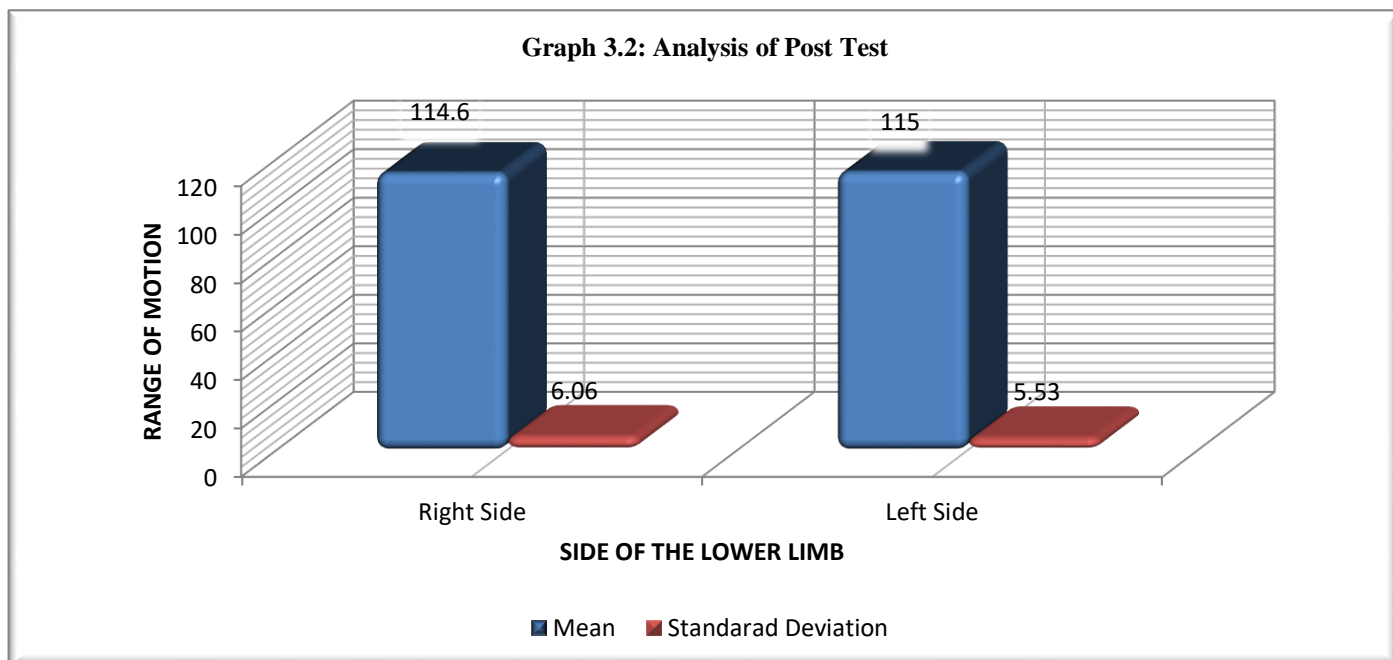
**Tabulation 3.1: Analysis of Pre Test**

Analysis of Pre Test:			
Sl No.	Side of the limb	Mean	Standard Deviation
1	Right	85.8°	9.06
2	Left	88.6°	12.99



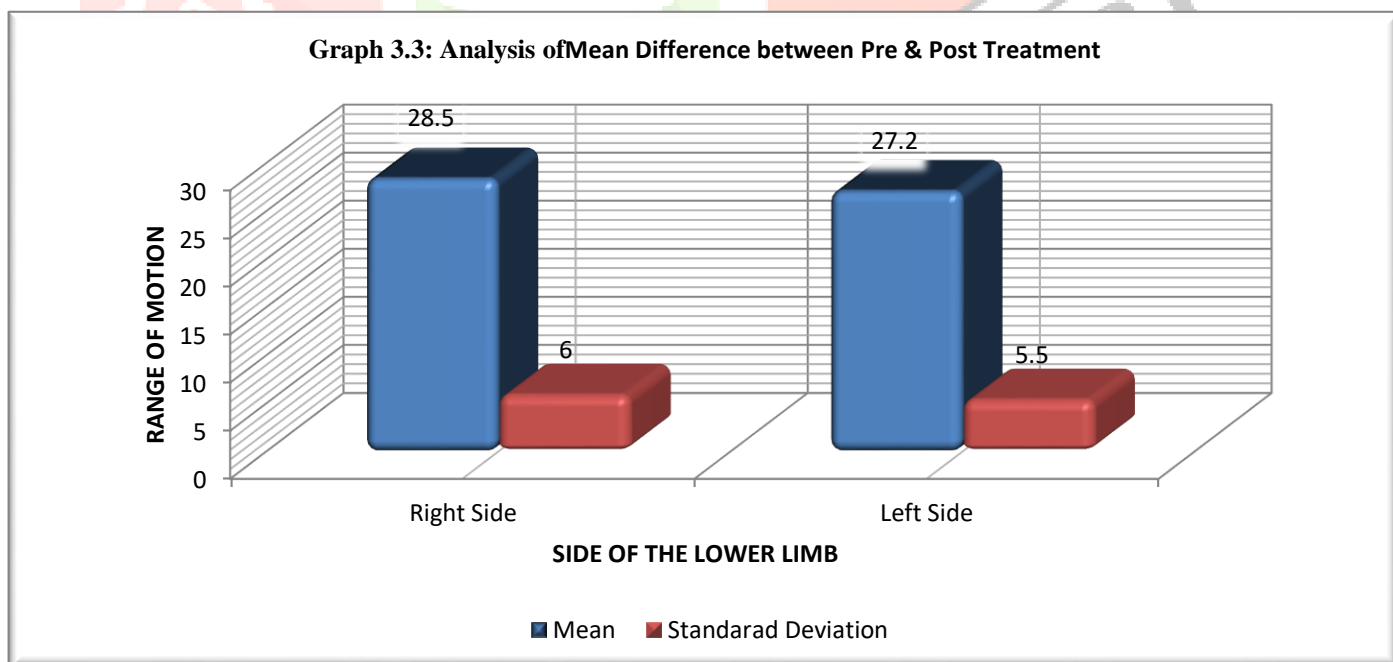
**Tabulation 3.2: Analysis of Post Test**

Analysis of Post Test			
Sl No.	Side of the limb	Mean	Standard Deviation
1	Right	114.6°	6.06
2	Left	115.9°	5.53



**Tabulation 3.3: Analysis of Mean Difference between Pre & Post Treatment:**

Analysis of Mean Difference between Pre & Post Treatment					
Sl No.	Side of the limb	Mean	Standard Deviation	T score	P value
1	Right	28.5°	6.0°	0.992	<b>&lt;0.001</b>
2	Left	27.2°	5.5°	0.849	



#### IV. DISCUSSION

Study was made on 30 subjects with hamstring tightness selected on basis of selection criteria. Contract relax technique is given us treatment programme for them. Their pre treatment knee extension was assessed. The subjects were explained about the technique before the commencement of treatment. The whole treatment is divided into 2 sessions for one day and for four day. After the final session of fourth day knee extension was re-evaluated. During the treatment none of them had any discomfort. The application of contract relax technique to these subjects maximally reduced the hamstring tightness and include knee extension. The results show that there is significant increase in knee extension from 85.8° to 114.6° in right side and from 88.6° to 115.9° in left side of the knee joint. The result reveals that contract relax technique as an effective means for relieving tightness. In my study the effectiveness of proprioceptive neuromuscular facilitation (PNF) technique (contract relax method) has been proved. So this can be used in various other conditions as treatment programme.

#### V. CONCLUSION

Based on the results, I conclude that the proprioceptive Neuromuscular Facilitation (PNF) techniques (Contract relax method) is effective in relieving hamstring tightness. All the 30 subjects were shown a significant improvement in increasing range of motion and extension of knee joint.

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