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**A STUDY TO EVALUATE THE EFFECT OF INSTRUMENT  
ASSISTED SOFT TISSUE MOBILIZATION (IASTM) ON  
HAMSTRINGS IN SUBJECTS WITH NON-SPECIFIC LOW BACK  
PAIN**

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**ABSTRACT**

**Background:** Low back pain (LBP) is a commonest musculoskeletal disorder in modern society, which affects 60% to 80% of the population suffering at least once in their life. Non-specific lowback pain is tension, soreness and/or stiffness in the lower back region for which it isn't possible to identify a specific cause of the pain. Several structures in the back, including joints, discs and connective tissues, may contribute to symptoms.

Instrument assisted soft tissue mobilization or simply (IASTM) is a new range of tool which enables clinicians to efficiently locate and treat individuals diagnosed with soft tissue dysfunction. The physiological mechanism associated with IASTM is proposed to be through introduction of microtrauma to the affected tissue and facilitating the inflammatory response phase of the healing cascade

**Aim:** The aim of the present study is to evaluate the difference in lumbar range in subjects with

non-specific low back pain by applying IASTM on hamstrings bilaterally.

**Methods:** An experimental study was done in Parul University. 8 subjects were given IASTM on hamstrings bilaterally for 2 weeks, 3 days a week, total of 6 sessions. The primary outcome measure was Modified Modified Schober test and subjects were assessed before and after intervention

**Results:** The statistical software used was IBM SPSS Statistics Version 27 for the analysis of the data. The Pre - test and Post-test MEAN  $\pm$  SD values for lumbar flexion were  $6.075 \pm 0.806$  and  $6.775 \pm 0.794$  respectively. However, results revealed a greater improvement in post modified modified schober test. And p value was shown to be 0.001 with  $p < 0.05$  significance level.

**Conclusion:** This study concluded that IASTM on hamstrings bilaterally was significantly effective in improving range in subjects with non-specific low back pain.

**Keywords:** Non- specific low back pain, Instrument Assisted Soft Tissue Mobilization, IASTM, Modified Modified schober test, low back pain, lumbar ROM

## INTRODUCTION

Low back pain (LBP) is a commonest musculoskeletal disorder in modern society, which affects 60% to 80% of the population suffering at least once in their life [1]. Globally the annual prevalence of LBP is estimated at 38%. For Asian country the prevalence rate of LBP is 28.5% [2]. Low back pain has consistently held the position as the primary reason for absenteeism from work and a predominant factor prompting medical rehabilitation for numerous years [3]. Non-specific low back pain is defined as low back pain not attributable to a recognisable, known specific pathology (e.g, infection, tumour, osteoporosis, fracture, structural deformity, inflammatory disorder, radicular syndrome, or cauda equina syndrome [4]. Non-specific low back pain is tension, soreness and/or stiffness in

the lower back region for which it isn't possible to identify a specific cause of the pain. Several structures in the back, including joints, discs and connective tissues, may contribute to symptoms [5]. The lower back is commonly defined as the area bounded by the bottom of the rib cage and the buttock creases. Some people with non-specific low back pain may also feel pain in their upper legs, but the low back pain usually predominates. Several structures, including the joints, discs and connective tissues, may contribute to symptoms [5]. Household chores, traditionally shouldered by women, represent unpaid labor involving essential routine tasks like cleaning, cooking, washing, lifting, shopping, and family care responsibilities such as

child-rearing. These duties demand considerable physical, emotional, and intellectual effort, contributing to the risk of musculoskeletal disorders like low back pain (LBP). Research indicates that the energy expended in housework can surpass that of certain paid occupations, and the associated hazards parallel those found in other work environments. Women are actively engaged in these household activities, underscoring the significance of recognizing and addressing the challenges associated with this unpaid labor [6].

Instrument assisted soft tissue mobilization or simply (IASTM) is a new range of tool which enables clinicians to efficiently locate and treat individuals diagnosed with soft tissue dysfunction [7]. The physiological mechanism associated with IASTM is proposed to be through introduction of microtrauma to the affected tissue and facilitating the inflammatory response phase of the healing cascade [8].

Multiple articles suggests that IASTM effect on low back pain. There are less literatures which showed the effect on low back pain by IASTM on hamstrings to improve range. The purpose of the present study is to evaluate the effect to improve range in subjects with non-specific low backpain by IASTM on hamstrings bilaterally.

#### **NEED OF THE STUDY**

Chronic low back dysfunction (CLBD) significantly impacts various aspects of an

individual's life, including psychological, physical, and socioeconomic dimensions. Low back pain (LBP) imposes a substantial burden on both the individual and society at large. Most cases of LBP fall under the category of non-specific (nsLBP), meaning they lack a clear structural cause, such as vertebral fractures.

There are less literatures which showed the effect on low back pain by IASTM on hamstrings. The purpose of the present study is to evaluate the effect to improve range in subjects with non-specific low back pain by IASTM on hamstrings bilaterally.

#### **AIM AND OBJECTIVES**

##### **AIM**

The aim of the present study is to evaluate the effect to improve range in subjects with non-specific low back pain by IASTM on hamstrings bilaterally.

##### **OBJECTIVES**

To evaluate the effect of IASTM on range among subjects with non-specific low back pain.

##### **HYPOTHESIS**

###### **NULL HYPOTHESIS: (H0)**

- There will be no significant effect of IASTM to improve range among subjects with non-specific low back pain.

###### **ALTERNATE HYPOTHESIS: (H1)**

- There will be significant effect of IASTM to improve range among

subjects with non-specific low back pain.

## MATERIAL AND METHODS

Data Source: Parul Sevashram Hospital, Parul University, Vadodara.

Study Design: An Experimental study

Sample Size: 8

Intervention Duration: 2 weeks (3 days a week)

### INCLUSION CRITERIA:

- The participants between 18-30 years.
- Both male and female will be included in the study.
- The subject having range of lumbar flexion ( $>$  or  $=$  7) and lumbar extension ( $>$  or  $=$  3)
- Subjects who will sign consent form willingly.
- Participants who can understand English, Hindi or Gujarati.

### EXCLUSION CRITERIA:

- History of back surgery.
- Patients who had spinal fracture.
- Spinal tumor or other malignancy.
- Medicine for psychiatric disorder.
- Clinical signs of radiculopathy.
- Lumbar stenosis.

- Neuromuscular disease like multiple sclerosis, fibromyalgia and spondylolisthesis.

- Any other pathology.

### MATERIALS

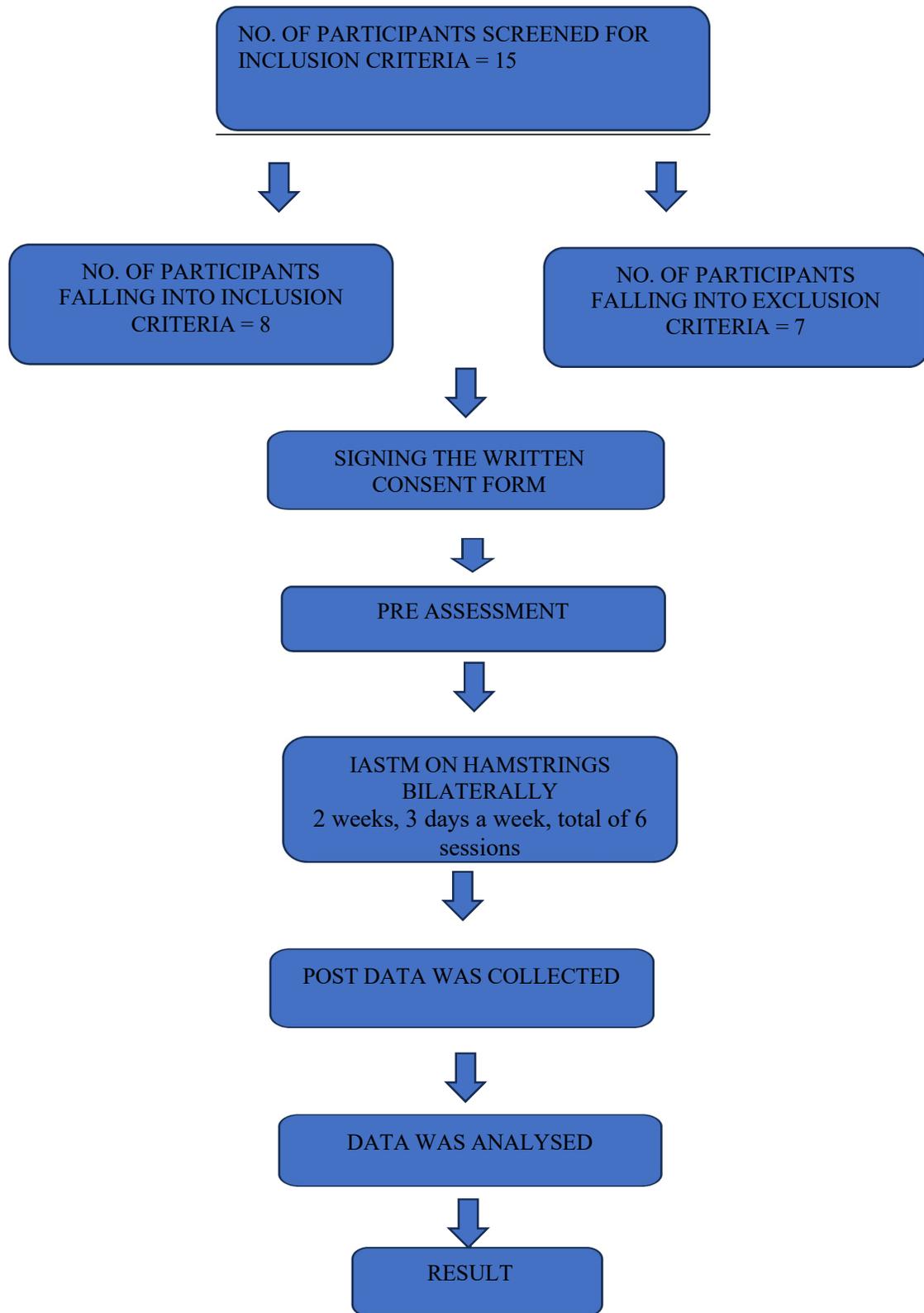
- Plinth
- Paper and Pen
- Assessment form
- Consent form
- Measuring Tape

### METHODS

This study analyzed the effect of IASTM to improve range among subjects with non-specific low back pain. Participants for the research studies were recruited from Parul University.

Subjects were recruited for the study and once they fall into inclusion criteria, they have been asked to sign the written informed consent form. The subject has complete freedom to refuse to participate in the study. 8 subjects were given IASTM on hamstrings bilaterally for 2 weeks, 3 days a week, total of 6 sessions. The primary outcome measure was Modified Modified Schober test and subjects were assessed before and after intervention and then the final result was analysed.

**PROCEDURE**



**EXERCISE PROTOCOL Group IASTM (n= 8): [7]**

IASTM (Instrument-Assisted Soft Tissue Mobilization) was administered on both hamstrings, targeting the biceps femoris, semitendinosus, and semimembranosus, with the patient in a prone position. The treatment involved applying the instrument parallel to the muscle fibers for around 20 seconds at a 45° angle, followed by an additional 20 seconds with the instrument at a 45° angle perpendicular to the muscle fibers. This entire process resulted in a total treatment duration of approximately 40 seconds.

**STATISTICAL ANALYSIS**

After gathering the data, it was arranged in Microsoft Excel. The statistical software used was IBM SPSS Statistics Version 27 for the analysis of the data and Microsoft Word and excel have been used to generate graphs and tables.

**RESULTS:**

The Pre - test and Post-test MEAN ± SD values for lumbar flexion were 6.075 ± 0.806 and 6.775 ± 0.794 respectively. P value was 0.001 discovered, indicating that there was statistically significant difference in modified modified schober test in pre and post after the intervention, however results showed improvement in post result in modified modified schober test.

**Table 1: Age Distribution**

AGE	TOTAL	PERCENTAGE
18-20	0	0
21-25	7	87.5%
25-30	1	12.5%
	8	

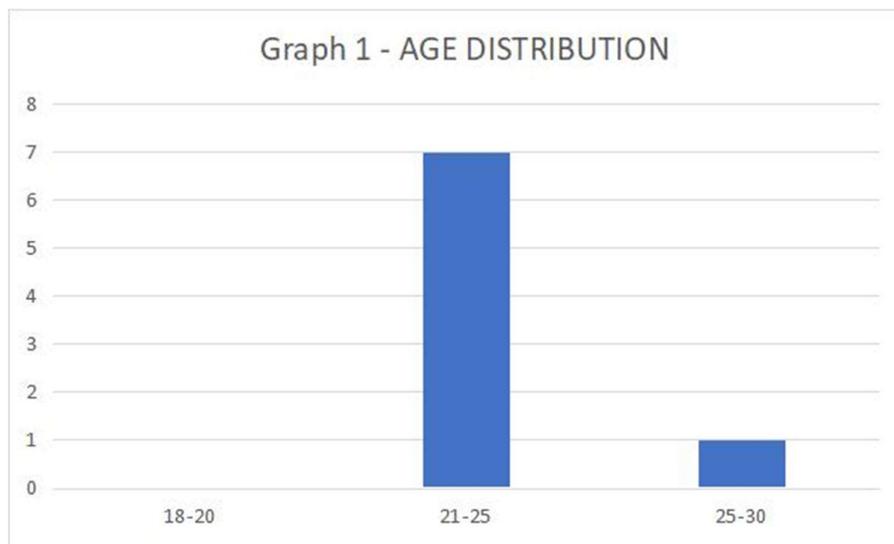


Table 2: Gender Distribution

GENDER	TOTAL	PERCENTAGE
MALE	1	12.5%
FEMALE	7	87.5%
	8	100%

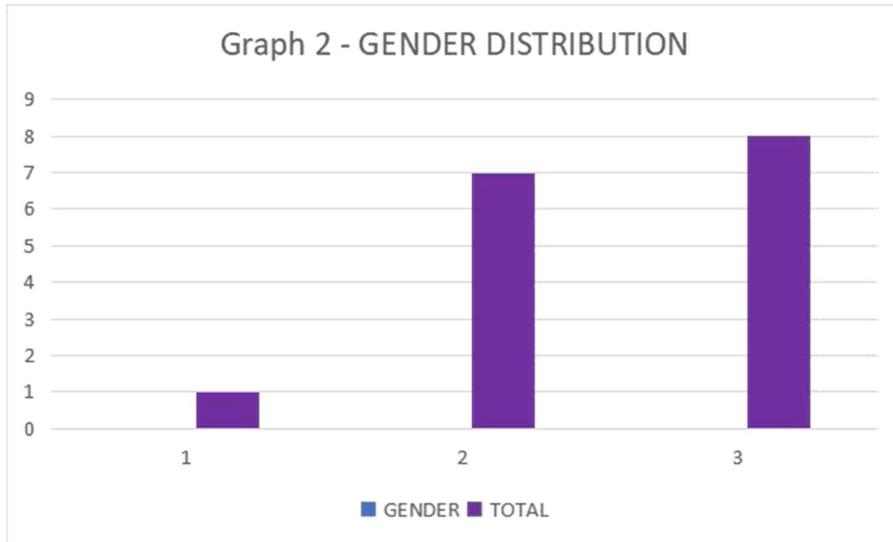


Table 3: Pre And Post Comparison of Lumbar Flexion With Modified Modified Schober Test

GROUP	MEAN	SD	Z-VALUE	P-VALUE
PRE	6.075	0.806	-2.527	0.001
POST	6.775	0.794		

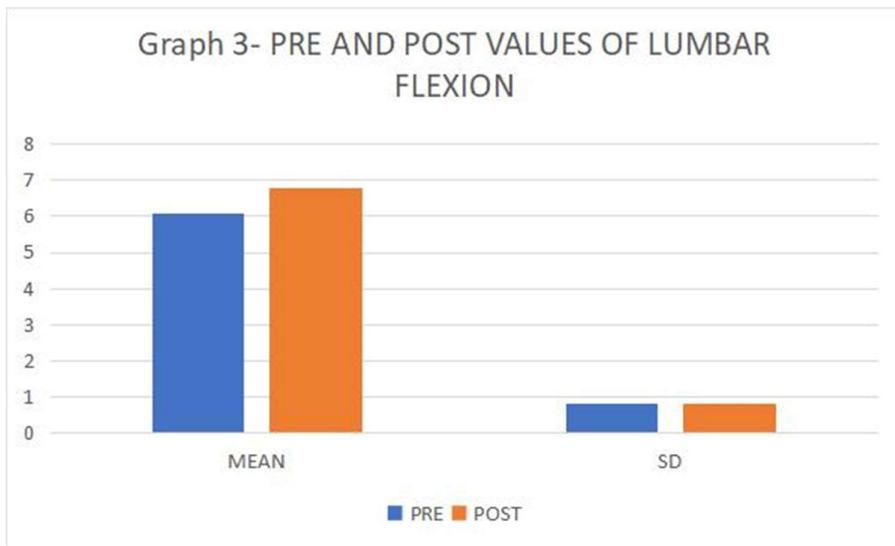


Table 4: Pre And Post Comparison of Lumbar Extension With Modified Schober Test

GROUP	MEAN	SD	Z-VALUE	P-VALUE
PRE	1.785	0.97	-2.379	0.001
POST	2.26	0.829		

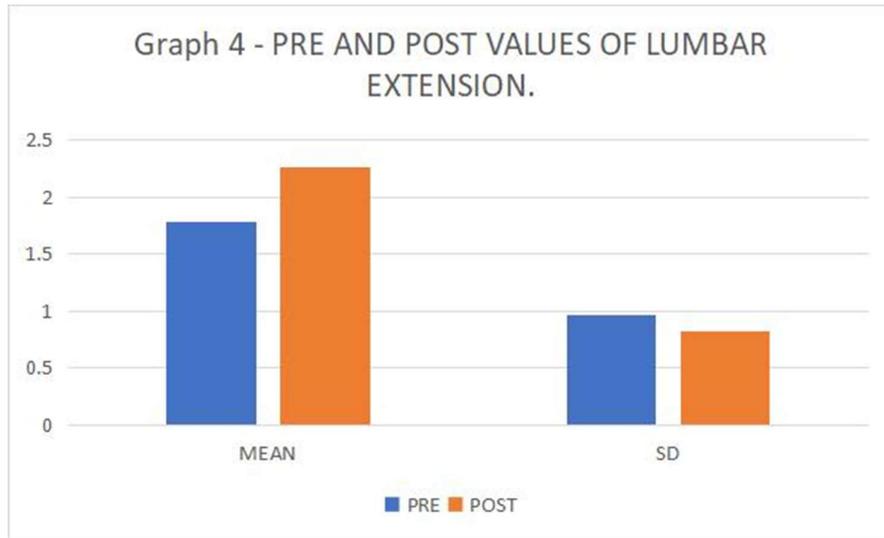


Figure 1: Iastm on Hamstrings In Perpendicular Direction



Figure 2: Iastm on Hamstrings In Parallel Direction

## DISCUSSION:

Many researchers have investigated the effects of instrument assisted soft tissue mobilization in patients. However, few studies have investigated the effect of instrument assisted soft tissue mobilization on ROM, pain in patients with non- specific low back pain [7]. We investigated the effects of the Graston technique for improving range of lumbar flexion and lumbar extension by applying IASTM on

bilateral hamstrings with 20 seconds parallel and 20seconds perpendicular to the hamstrings muscle fibers.

Jeong - Hoon Lee *et al* conducted a study on “The effect of Graston technique on the pain and range of motion in patients with chronic low back pain” in which they investigated the effects of the Graston technique compared with general exercise in patients with CLBP. Their results showed that the Graston technique

decreased pain and increased ROM in patients with CLBP. Their results confirmed that both methods lead to pain relief and increased ROM. These findings indicate that the Graston technique could be recommended in the rehabilitation of patients with CLBP. The Graston group showed improvements decreased pain and increased ROM. In this study, pain significantly decreased in Graston group.

Previous studies explained that pain decreases could be affected erector spinae activity (9), and back muscle activity was decrease [10]. Our results demonstrated that after performing the Graston technique, lumbar range improved. Thus, Graston technique may help to improve lumbar range in patients with NSLBP. We propose that Graston technique on hamstrings bilaterally helps to improve lumbar range of motion. Thus the Hypothesis of the present study was confirmed that Graston technique can be used for improving range of lumbar.

The present study had several limitations. First, it only investigated lumbar range of motion ,and did not measure the muscles activity, changes in pain. Thus, further studies are required to investigate changes in back muscle activity after the Graston technique. Second, the duration of intervention was short. Usually, a 6–8 week or longer intervention period hasbeen used because

the most significant progress may be made after at least 6 weeks [11]. However, what is the optimal exercise period remains unclear [12].

#### CONCLUSION:

This study concluded that IASTM on hamstrings bilaterally was significantly effective in improving range in subjects with non-specific low back pain.

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