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# IMMEDIATE EFFECT OF MYOFACIAL RELEASE ON HAMSTRING FLEXIBILITY IN HEALTHY PHYSIOTHERAPY STUDENTS : AN EXPERIMENTAL STUDY

Physiotherapy

**Dr. Vaishnavi Raut** Assistant Professor, Musculoskeletal Dept. Anand College Of Physiotherapy, Chh. Sambhajinagar, Maharashtra, India.

## ABSTRACT

**Background :** For proper biomechanical functioning in sports and daily activities, flexibility is crucial. Muscle tightness will make it impossible for the person to accomplish tasks that require pain-free range of motion. Myofascial release is commonly practiced manual therapy techniques used for the purpose of relieving soft issues from an abnormal hold of tight fascia. **Materials And Method :** 30 students were included in this study . Application of Myofacial release technique was done for 5-10 mins . Active knee extension test was used to measure the popliteal angle in both lower extremity using universal goniometer. Popliteal angle was measure before application of MFR and immediately after the application of MFR Statistical analysis done by using SPSS software . **Result :** Data analysis shows that mean popliteal angle value before MFR was 35.36and after application of MFR was 32.23 on right side and 30.4 & 27 on left side causing considerable improvement in hamstring flexibility. **Conclusion:** Present study concludes that myofascial release technique is an effective method in improving hamstring flexibility .

## KEYWORDS

Hamstring tightness, MFR, Active knee extension test (AKET), Flexibility, Popliteal angle

## INTRODUCTION

Hamstring includes group of three muscles, semitendinosus, semi membranosus and biceps femoris , which makes up the posterior compartment of the thigh . They are the major knee flexors and also helps in hip extension.[9]

Flexibility is defined as the ability of a muscle to lengthen and allow one joint (or more than one joint in a series) to move through a range of motion. It is a physical fitness attribute and is often evaluated from the joint range of motion, an essential element of normal biomechanical functioning in sports and daily living activity.[6]

The primary cause of muscle tightness is a decrease in the muscle's capacity to deform, which results in a smaller range of motion at the affected joint. Tight hamstrings are associated to a faulty motor control pattern that results in postural muscles firing at a lower level than they should , making the hamstrings function more as stabilizers than as prime movers.[1,8]

Length-tension relationship of muscle as well as shock absorbing ability of the limb is affected by tightness of muscle. Once flexibility decreases, risks of muscular and postural imbalance grows higher along with the risk of muscular sprain.[1]

Myofascial release (MFR) is one of the commonly used manual techniques to facilitate the stretching of corresponding tissue continuously or improve the extensibility of soft tissue through compression while restoring restricted fascia or normal muscular length [2] . This techniques is used for the purpose of relieving soft issues from an abnormal hold of tight fascia. Direct bodily effects range from alleviation of pain, improvement of athletic performance, and greater flexibility and ease of movement to more subjective concern such as better posture. Myofascial Release is a type of effective hands-on interactive method that provides stretching, compression and sustained pressure into restricted areas of fascia (connective tissue) in the body to reduce pain and restore motion.[3]

### Selection Criteria

**Inclusion Criteria :**

- Male and Female students
- 18 – 25 years of age group
- Subject with at least 15 degree loss of knee extension .
- Willing to participate

**Exclusion Criteria :**

- Any history of previous hamstring injury / surgery
- History of lower extremity fractures
- Low back pain since last 2 months
- History of neuromuscular diseases

## MATERIALS AND METHODOLOGY

**Study Design :** Experimental study
**Study Setting :** ACOP campus
**Study Population :** students with hamstring tightness
**Sampling Technique :** convenience sampling
**Sample Size :** 30

### MATERIALS

- Universal goniometer
- Couch
- Data collection sheet
- Pen
- Consent form

### Methodology

This study was mainly done on college going students . Ethical clearance was taken from the institutes ethical committee. Informed consent was taken from the students and the procedure is first explained to them and assessed their hamstring length by active knee extension test.

The subject lies supine on a plinth with their knee and hip flexed to 90 degree. Position of femur was maintained by using frame. Students were instructed to extend their right leg as far as possible; keeping their foot relaxed and hold the position for 5seconds same procedure is performed for left leg.. And at the end of the 5 second holding period the angle of knee extension was measured. Fulcrum of goniometer was positioned over the axis point previously marked on the lateral joint line.[6]

### Protocol :

Myofacial release technique is given with the patient in prone lying position and therapist standing by the side of patient . MFR was given from proximal to distal direction using a light amount of pressure over hamstring muscle for 4-8 mins by using ulnar border / knuckle of both the hands . [2,4]

Immediately after application of MFR to hamstring Active knee extension test was done to measure the knee extension angle.

### Statistical Analysis And Result

**Table No. 1 Gender Wise Distribution Of Participants**

| Gender | Frequency | Percentage |
|---|---|---|
| Male | 6 | 20 % |
| Female | 24 | 80 % |
| Total | 30 | 100 % |

**Interpretation –** Table 1 shows that study includes 80% of female subjects and 20% of male subjects .

**Table No. 2 Active Knee Extension Values Pre And Post Mfr On Right Side**

| Popliteal angle | Pre MFR | Post MFR |
|---|---|---|
| Mean | 35.36666667 | 32.23333333 |
| SD | 9.58 | 9.12 |

**Interpretation :** In table 2 mean popliteal angle before MFR is 35.36 and after MFR is 32.23 shows significant reduction in hamstring

tightness on right side .

**Table no. 3 Active knee extension values pre and post MFR on left side**

| Popliteal angle | Pre MFR | Post MFR |
|---|---|---|
| Mean | 30.4 | 27.3 |
| SD | 9.64 | 8.82 |

**Interpretation :** In table 3 mean popliteal angle before MFR is 30.4 and after MFR is 27.3 shows significant reduction in hamstring tightness on left side .

## DISCUSSION

Present study was conducted to find out the immediate effect of myofascial release on hamstring flexibility in college going students. Flexibility dysfunction is a typical issue that affects both athletes and regular people, particularly when it comes to the hamstring muscles. In addition to causing decreased range of motion, hamstring tightness can result in a number of other musculoskeletal issues. Muscle tightness affects the Length-tension relationship of muscle as well as shock absorbing ability of the limb. Hamstring tightness creates a vicious circle of range reduction and results into increase in postural problems.[1,6]

In present study total 30 subjects both male and female were included. Hamstring tightness on both the lower extremity was measured by using active knee extension test . Popliteal angle was measure before application of MFR and immediately after MFR .

Table no. 2 showed significant decrease in Active Knee Extension Test (AKET) angle on right side after treatment ( 35.36 ) in comparison with before treatment ( 32.23 ).

Table no 3 shows considerable decrease in Active Knee Extension Test (AKET) angle on left side after treatment in comparison with before treatment (30.4 & 27.3 respectively )

Dr . Ketaki et al , in their study compared Myofacial release with passive stretching and found that Myofacial release technique is more effective in improving hamstring flexibility than passive stretching .[2]

Sajidur Rahman, et. al. Effect of Myofascial Release on Hamstring Tightness among Knee Osteoarthritis Patient , Journal of Positive School Psychology 2022, Vol. 6, No. 3, 4027 – 4034. Conducted a study on osteoarthritis patients . 30 patients were randomly allocated to two groups Group A ( myofascial release + conventional therapy ) . Group B conventional therapy only . Significant difference in VAS , AKET and KOOS score is seen in group A patients compared with group B . showed that Myofascial release shows effectiveness in improving active knee extension range of motion, improved pain VAS score and decreased functional disability in patient with knee osteoarthritis condition.[4]

Lohr and Medina – Porqueres, 2021 , reported that with a single application of myofascial intervention , there was a change in neuromechanical properties of the muscle ( increase in contraction speed ) Lohr and medina – porqueres, 2021 .[8]

Myofascial Release appears to have an impact on both the ground substance consistency and the elastocollagenous complex (integrated collagen and elastin fibers) . Tissue tension within the elastocollagenous complex is relieved by Increased soft-tissue flexibility . While the density and viscosity of the matrix (ground substance) decreases, the metabolic rate increases, resulting in improved metabolism and health. Musculoskeletal dysfunction can be exacerbated and sustained if the fascia is shortened and tightened and twisted . [2,3]

## CONCLUSION

Looking at statistical analysis present study shows that myofascial release is an effective method in improving hamstring flexibility . And it can be incorporated in daily exercise regimen for better outcomes and to improve quality of life .

### Limitation

- Male and female students were not equally distributed .

### Future Scope

- Further long duration study needs to be conducted to see the long term result of MFR .

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