



# EFFECTIVENESS OF SELF MYOFASCIAL RELEASE TECHNIQUE USING FOAM ROLLER FOR SARTORIUS MUSCLE PAIN AND LOWER EXTREMITY FUNCTIONS AMONG PROFESSIONAL FEMALE TAILORS -AN EXPERIMENTAL STUDY.

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## **Abstract:**

This study has been undertaken to investigate the effect of self myofascial release technique by foam roller to reduce pain along Sartorius and to improve lower extremity functions among professional female tailors. Due to the repetitive and continuous pedaling movements there is adaptive shortness of Sartorius muscle leading to pain radiating from hip to legs. Myofascial release is a technique used to improve joint range of motion (ROM), to reduce muscle tension and pain. Experimental study was performed from 27<sup>th</sup> jan 2023 to 11<sup>th</sup> feb 2023.

24 participants were selected according to Inclusive, diagnostic criteria (Hip flexors length test) and Exclusive criteria. Pre and Post intervention NPRS (Numerical Pain Rating Scale) and LEFS (Lower Extremity Functional Scale) score was taken. Paired T test was done. The results obtained for Myofascial release technique on Professional female tailors with pain along Sartorius by Foam rolling suggests significance as P value obtained was ( $<0.0001$ ) and T values was values for NPRS(RT.LL) is 15.0037 ,for (LT.LL) is 14.3725 , and for LEFS is 16.6560.

This study shows there is significant effect of self myofascial release technique by foam roller for pain along sartorius muscle and improvement of the lower extremity functions in professional female tailors.

**Keywords:- Self Myofascial Release Technique, Foam rolling, Sartorius**

## **I.INTRODUCTION**

In India, according to the International Labor Organization, approximately 5.7 million females are involved textile industry. Gangopadhyay and Das (2010) found that the suffered from occupation related discomfort mostly affecting the lower back (98%), knees (85%) and shoulders (77%). Preliminary study among 3 million (2001-2009) Indian tailors population found that 75% reported musculoskeletal symptoms related to work.<sup>[1]</sup>

A tailor by occupation is a person who makes, repairs, or alters clothing. Due to their prolong work nature they tend to have various musculoskeletal problems such as joint pain, muscular strain, ligament sprain and

also postural deviations. The musculoskeletal discomfort across mainly due to two reasons, the working condition and posture demands of the work place.<sup>[1]</sup>

Prolong sitting and repeated pedaling movements' results in pain and discomfort of the lower limb leading to muscular strain.<sup>[1]</sup>

One such muscle that is involved in repetitive strain due to the pedaling activity is the Sartorius muscle, which is also known as tailors muscle. Tailors sit with their legs crossed while they sew and would have pain along the path of the Sartorius muscle.<sup>[1]</sup>

The Sartorius is the longest muscle in the body and is situated superficially, The proximal tendon of the sartorius arises from the anterior superior iliac spine. The muscle belly like an S-shaped tape twists around the anterior, and then around the medial surface of the thigh. The belly of the sartorius constitutes anterior wall of the adductor canal. Then the belly turns slantwise forward at the medial epicondyle of femur which together with quadriceps — its medial head — serves as a “trochlea” for the sartorius muscle. At the distal attachment they go into a flat divergent tendon creating in its further section superficial part of the pesanserinus<sup>[2, 3, 4, 5]</sup>. At the hip it flexes, weakly abducts, and rotates the thigh laterally. At the knee, it can flex the leg; when the knee is flexed, it also rotates the leg medially<sup>[21]</sup>

Myofascial release is a collection of techniques used for the purpose of relieving soft tissue from an abnormal hold of a tight fascia.<sup>[10]</sup> The physiology behind this technique involves the golgi tendon organ.<sup>[11]</sup> The pressure associated with myofascial release causes the golgi tendon organ to sense a change of tension in the muscle and responds to this high or prolonged tension by inducing relaxation of the muscle spindles.<sup>[11]</sup>

Self-myofascial release (SMR) is a popular intervention used to enhance a myofascial mobility. Common tools include the foam roll and roller massager. Evidence exists that suggests these tools can enhance joint range of motion (ROM) and the recovery process by decreasing the effects of acute muscle soreness, delayed onset muscle soreness (DOMS), and post exercise muscle performance.

## II. NEED OF STUDY

Due to the repetitive and continuous pedaling movements and prolong crossing of the legs there is adaptive shortness of Sartorius muscle leading to pain radiating from hip to legs. It is rather disappointing that the tailoring occupation which employs great human potential has not been given appropriate attention by research scholars in particular, to study the adaptive shortening of Sartorius muscles.

This study was conducted to investigate the effect of self myofascial release technique by foam roller to reduce pain along Sartorius and to improve lower extremity functions among professional female tailors.

## III. AIM

To check the effectiveness of self myofascial release technique using foam roller for sartorius muscle pain and lower extremity functions among professional female tailors.

## IV. OBJECTIVES

- To study the effectiveness of Self Myofascial Release technique by foam roller on sartorius pain among professional female tailors at the end of 4 weeks.
- To study the effectiveness of Self Myofascial Release technique by foam roller to improve lower extremity functions among professional female tailors at the end of 4 weeks.

## V. HYPOTHESIS

- **NULL(H<sub>0</sub>):** Self Myofascial Release Technique by foam roller will have no effect on sartorius pain and lower extremity functions in professional female tailors.

- **ALTERNATE (H<sub>1</sub>):** Self Myofascial Release Technique by foam roller will have effect on sartorius pain in professional female tailors.
- **ALTERNATE (H<sub>2</sub>):** Self Myofascial Release Technique by foam roller will have effect on lower extremity functions in professional female tailors.

## VI. METHODOLOGY

- **STUDY DESIGN:-** Experimental study
- **SAMPLE SIZE:-**24
- **SAMPLING METHOD :-** Convenient sampling
- **STUDY POPULATION:-** Female professional tailors
- **STUDY SETTINGS:-**Tailors in and around Pune
- **STUDY DURATION:-** 6 months
- **INTERVENTION:-** 3 sessions /week ( For 4 weeks)
- **TREATMENT TIME:** 15-20min

## VII. MATERIALS

Material used:-

- Pen
- Paper
- Foam roller
- Plinth
- Yoga mat
- Stop watch
- Consent form
- Scales
- Data collection sheet
- Mobile camera

## VIII. INCLUSION CRITERIA:

- Age : 20-40 yrs
- Female tailors who works min. 8hrs a day
- Pain present along the course of the Sartorius muscle for at least 3 week
- NPRS:- Scale of 5 and above
- BMI = 18.5 – 24.9 kg/m<sup>2</sup>
- Bilateral Sartorius Tightness

## IX. EXCLUSION CRITERIA

- Infections
- Tumor
- Cardiovascular conditions
- Neurological conditions.
- Recent fractures of both upper and lower limbs
- Malunited fracture of both upper and lower limbs
- Deformities of both upper ,lower limbs and spine
- Females undergone hysterectomy and natural postmenopausal women
- Spine conditions such as spondylosis, spondylitis and spondylolysthesis

## X. DIAGNOSTIC CRITERIA

### ● HIP FLEXOR LENGTH TEST (FOR SARTORIUS TIGHTNESS)

#### ● Starting Position:

Seated at the end of the table, with the thighs half off the table. The examiner places one hand behind the subject's back and the other hand under one knee, flexing the thigh toward the chest and giving assistance as the subject lies down. The subject then holds the thigh, pulling the knee toward the chest only enough to flatten the low back and sacrum on the table.<sup>[25]</sup>

#### ● Test Movement: If the left knee is flexed toward the chest, the right thigh is allowed to drop toward the table, with the right knee flexed over the end of the table.<sup>[25]</sup>

#### ● For sartorius tightness:-

During the hip flexor length test, a combination of three or more of the following in the lower limb which is not taken towards the chest indicate tightness of the sartorius : abduction of the hip, flexion of the hip, external rotation of the hip and flexion of the knee.<sup>[25]</sup>



Fig.1.Normal hip flexor length test



Fig.2.Shortness of sartorius

## XI. PROCEDURE

- The study was began with a presentation to the ethical committee of PES Modern College Of Physiotherapy the participants was selected according to inclusion criteria (diagnostic test) and exclusion criteria
- Purpose was explained to the participants and written consent was taken
- Pre intervention NPRS and LEFS score was taken
- Self MFR was given by foam roller for 4 weeks (3 sessions per week)
- Post intervention NPRS and LEFS score was taken
- Data was collected and statistical analysis was done

## XII. FOAM ROLLING PROTOCOL

- Before self MFR 5 min warm up exercises will be given.( Light jogging.)
- Self MFR will be given in 3 training sessions per week for 4 weeks<sup>[14]</sup> by smooth foam roller of dimension (45cm×15cm).
- Participants will receive visual and verbal instructions by the therapist on how to properly perform the rolling technique.

- In each subset, they will roll their Sartorius unilaterally for 30–40 seconds (10 times back and forth) , from ASIS to medial side of proximal tibia (thigh). [24,15]
- After finishing the first leg, they will be repeating the exercise with the other leg (1 set). Altogether, 3 sets in 1 session will be perform with 1 minute rest in between.[24]
- After completing the 1 session, cool down exercises will be given for 5 min.(Jacobson’s Relaxation)

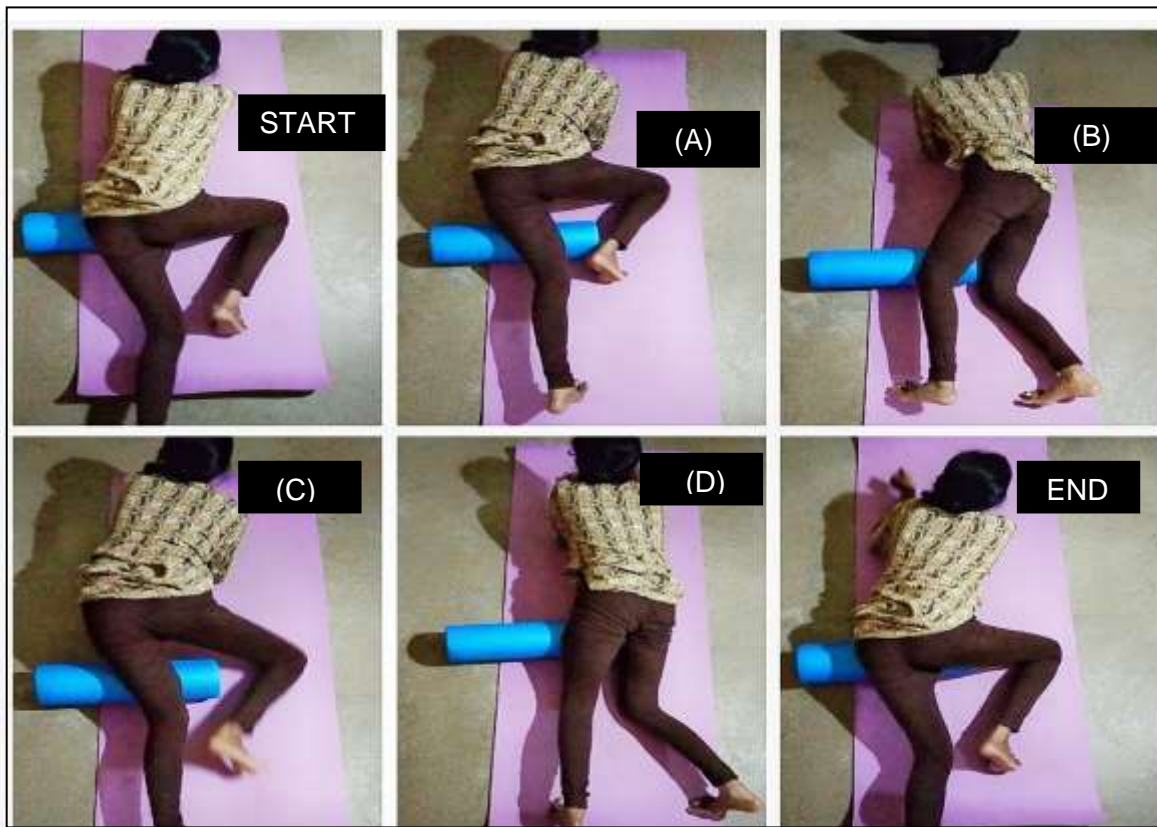


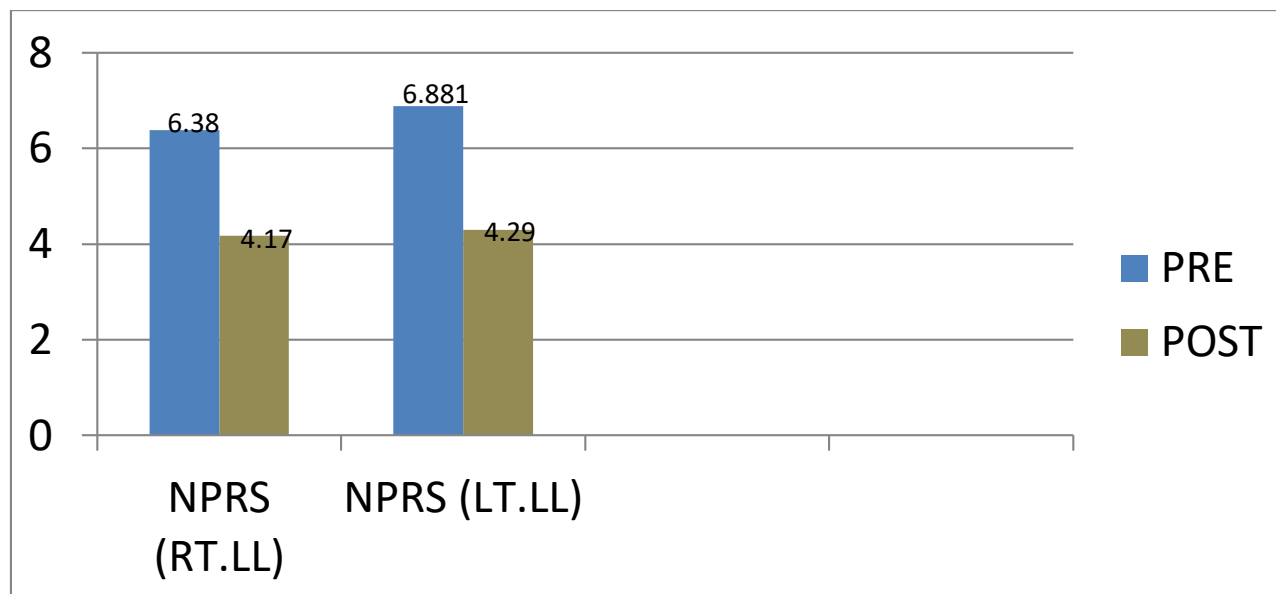
Fig.3. Foam rolling for left sartorius

### XIII. RESULT

- The study included 24 professional female tailors.
- Paired t test was done.
- The results obtained for self MFR given by foam rolling to reduce pain along sartorius and to improve lower extremity functions in professional female tailors measured by NPRS and LEFS suggests significance as P value obtained was ( $<0.0001$ ) and T values was values for NPRS(RT.LL) is 15.0037 ,for (LT.LL) is 14.3725 , and for LEFS is 16.6560.

Numerical pain Rating scale (NPRS)	Pre treatment mean score +SD	Post treatment mean Score +SD	t value	p value	Results
RT. LL	6.38 ±0.92	4.17±1.01	15.0037	<0.0001	Extremely significant
LT.LL	6.881±.15	4.29±1. 08	14.3725	<0.0001	Extremely significant

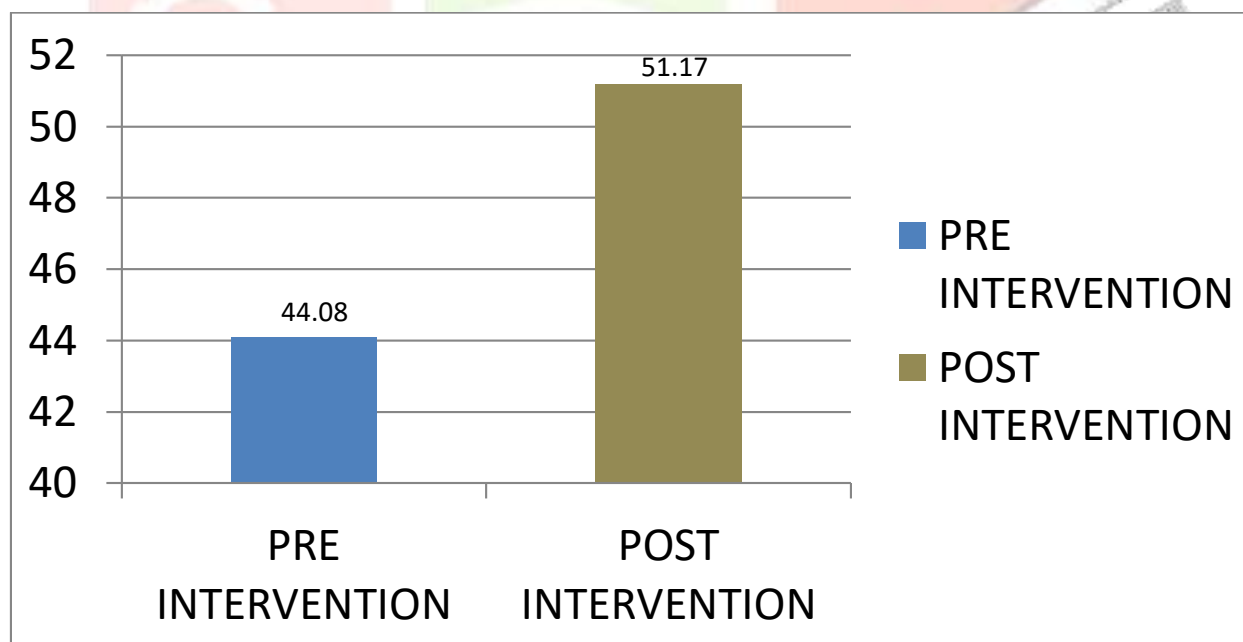
Table 1.Comparison of pre and post treatment NPRS scores along sartorius muscle pain in right and left lower limb of professional female tailors.



Graph1.NPRS SCORE (RT.LL AND LT.LL)

LOWER EXTREMITY FUNCTIONAL SCALE (LEFS)	Pre treatment mean score +SD	Post treatment mean score +SD	t value	p value	Results
	44.08±5.42	51.17±4.22	16.6560	<0.0001	Extremely significant

Table 2.Comparison of pre and post treatment LEFS scores in professional female tailors



Graph 2. LEFS Score

**XIV. DISCUSSION**

- The aim of the study was to investigate the effectiveness of Self MFR by foam rolling to decrease the pain along sartorius muscle and to improve the lower extremity functions.
- Total 24 participants was of age 20-40 years were trained for 4 weeks to find the effectiveness of self MFR by foam rolling on pain along sartorius and in lower extremity functions.

- The hip flexor length test was used to assess the shortness of sartorius muscle
- Self myofascial release was given by foam rolling which is used for the purpose of relieving soft tissue from abnormal hold of tight fascia and to reduce the pain along sartorius.
- According to Daniel H. Junker and Thomas L. Stoggl et al, The foam roll seen as a effective tool to increase hamstring flexibility within 4 weeks. The physiology behind that the exerted pressure of the foam roll stimulates the Golgi tendon unit and decreases muscle tension. Another possible effect is improved hydration of tissues. While working, soft tissue is squeezed like a sponge; consequently, it is soaked through with fluid, which improves motion between the different layers of fascia and increases blood flow and temperature and improves muscle performance. [15]
- According to, Aynollah Naderi, Mohammad hossein Rezvani, Hans Degens et al, Foam rolling post exercise resulted in decrease in muscle pain ,diminished delayed onset muscle soreness and improved recovery of muscle strength and joint proprioception is because the fascia that play a functional part in stability and locomotion<sup>24</sup> are populated with 3 groups of mechanoreceptors: type Ib Golgi tendon organs, type II Pacini corpuscles and Ruffini endings, and type III and IV interstitial myofascial tissue receptors.<sup>24</sup> The most abundant of all intrafascial mechanoreceptors, type III and IV sensory nerves, are responsive to the mechanical pressure delivered by FR and may change neural excitability, thereby reducing muscle tension and pain. [27]
- In this study Numerical Pain Rating Scale was used as a outcome measure for pain along sartorius muscle and Lower Extremity Functional Scale was used as a outcome measure to detect the changes in the lower extremity functions post treatment.
- The findings obtained in this study imply that Self Myofascial Release by Foam rolling is effective in reducing pain along sartorius muscle which is caused due to adaptive shortening of this muscle.

## XV. CONCLUSION

There is significant effect of self myofascial release technique by foam roller for pain along sartorius muscle and improvement of the lower extremity functions in professional female tailors.

## XVI. LIMITATIONS

Lack of long term follow up

## XVII. FUTURE SCOPE OF STUDY

- Professional male tailors can also be considered.
- Comparative study between professional male and female tailors can also be considered.
- Prevalance study for sartorius tightness in tailors can be done by hip flexor length test.

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