

# The differences in the effects of myofascial release and stretching on lower body flexibility

Azizah Rahmawati<sup>1</sup>, Muhsin Doewes<sup>2</sup> , Febriani Fajar Ekawati<sup>3</sup> 

<sup>1</sup>Sebelas Maret University, Departement of Sport Science, Klaten, Central Java, Indonesia. <sup>2</sup>Departement of Sport Science, Sebelas Maret University, Surakarta, Central Java, Indonesia. <sup>3</sup>Sebelas Maret University, Department of Sport Science, Karanganyar, Central Java, Indonesia.

## Abstract

**Received:**  
February 15, 2024

**Accepted:**  
March 25, 2024

**Online Published:**  
March 29, 2024

**Keywords:**  
Flexibility, myofascial release, stretching.

Flexibility is important in daily activities, but it is also very important in sports, especially for athletes. A decrease in flexibility results in a series of limitations, from reduced performance for light tasks such as sitting or dressing to a lack of movement coordination. Therefore flexibility is very important for normal movement, and maintenance is important to prevent musculoskeletal disorders. The aim was to determine the difference in the effect between Myofascial release and stretching on lower body flexibility. The study used the experimental research to look for cause and effect, using data analysis with the one way ANOVA. There was a difference in the flexibility of the lower limbs based on the different programs for using the MFR Foam Roller and Elastic Theraband, from the results of the one-way ANOVA test, it could be seen that the calculated F value of the difference in influence between the foam roller and stretch elastic theraband on changes in the lower body was 4.251 with a significance of 0.046 where the calculated F value was greater than the F table and the sig is less than probability 0.05. There was a difference in the effect of providing myofascial release using a foam roller and stretching using an elastic theraband on lower body flexibility. Stretching using an elastic theraband resulted in a higher effect compared to myofascial release with a foam roller, although the difference between the two was not very significant.

## Introduction

In daily activities, coordination of body parts is needed, especially body flexibility. In carrying out sports, an athlete's performance needs to be carefully prepared from a physical, emotional, technical and spiritual perspective. The physical health component includes one component of flexibility. Flexibility is the ability to move a single joint or a series of joints smoothly and easily through an unlimited, pain-free Range of Motion (ROM). ROM is influenced by joint capsule distensibility, muscle viscosity, and ligament and tendon tightness (Pristianto & Sudawan, 2021). Flexibility is the ability to move muscles and joints to the full or maximum range of motion (NaKamura, 2014). Maximum movement ability (ROM) plays a role in daily activities, for example reaching, bending and sports activities. In sports that use a lot of kicking movements, rapid acceleration or deceleration, and sudden changes in direction, it is possible for the hip adductor muscles to strain. Not only is it important in daily activities, flexibility is also very important when it comes to exercise, especially for athletes. A decrease in flexibility results in a series of limitations, from reduced

performance for light tasks such as sitting or dressing to a lack of movement coordination.

Therefore flexibility is very important for normal movement. Maintenance is important to prevent musculoskeletal disorders. This flexibility is closely related to the fascia tissue in the muscles. Fascia is a strong connective tissue that spreads throughout the body in a three-dimensional network from head to toe. Fascia is everywhere, surrounding every muscle, bone, nerve, blood vessel and organ down to the cellular level. In general, the fascia system provides support, stability and cushioning. Fascia is also a system that drives and forms dynamic flexibility of muscles. Tightening of the fascial system is a histological, physiological, and biomechanical protective mechanism that is a response to trauma. The fascia loses its flexibility, becomes restricted, and is a source of tension for the rest of the body. One way to increase flexibility is with myofascial release massage and stretching (Barnes, 1997). In the study, the aim was to determine the difference in the effect between Myofascial release and stretching on lower body flexibility.

✉ A. Rahmawati, e-mail: azizahrahmawati54@student.uns.ac.id

**To Cite:** Rahmawati, A., Doewes, M., & Ekawati, F. F. (2024). The differences in the effects of myofascial release and stretching on lower body flexibility. *Adv Health Exerc*, 4(1), 33-37.

## Methods

This research is a type of quantitative descriptive research with experimental methods, using SPSS data analysis with one way ANOVA. The one way ANOVA test in this study was used to determine whether there is a difference in the effect between the foam roller program and the elastic theraband stretching program on lower body flexibility. Sampling was carried out using a purposive sampling method; the research was carried out on the sports science faculty campus with 40 subjects as students. Stretching and MFR exercises were carried out 5 times a week for 4 weeks with direct supervision from the researcher.

## Results

The characteristics of the subjects in this study consisted of gender, age and BMI:

**Table 1**  
Characteristics' subjects.

	n	%
<i>Sex/Gender</i>		
1. Male	20	50
2. Female	20	50
<i>Age</i>		
1. 20-22	25	62.5
2. 19-20	15	37.5
<i>BMI</i>		
19-20 kg/m	7 people	17.5
21-22 kg/m	27 people	50
23-25 kg/m	6 people	15

Source: Processed data, researcher, 2023.

Based on these characteristics, the results obtained for gender consisted of 20 male subjects and 20 female subjects. For Characteristics Based on Age, in the 20-22 year age range there were 25 people with a percentage of 62.5% and for the 19-20 age range there were 15 people with a percentage of 37.5%. So the results obtained were more subjects aged 20-22 years. For characteristics based on body mass index (BMI), results were obtained for the range 19-20 kg/m totaling 7 people with a percentage of 17.5%, for the BMI range 21-22 kg/m totaling 27 people with a percentage of 50% and finally for the range 23-25 totaling 6 people with a percentage of 15%.

### Normality Test

In this study, the normality test was carried out using posttest scores from the control class and experimental

class. For samples totaling <50, the normality test used is the Shapiro-Wilk test (Faradiba, 2020). The following are the results of the normality test using SPSS 25.0 in Table 2.

**Table 2**  
Normality test using the Shapiro-Wilk test.

	Kolmogrov-Smirnov	Shapiro-Wilk
Pre Test	0.080	0.119
Post test	0.15	0.104

Source: Processed data, researcher, 2023.

Based on the normality test results using SPSS in the table, we can see that the sample is normally distributed. This is evidenced by the normality test results with pre-test significance of 0.199 and post-test significance of 0.104. Since this value is greater than 0.05, we can conclude that the data are distributed according to a normal curve.

### Homogeneity Test

The Homogeneity test is a statistical test used to show that two or more sample data groups come from populations with the same variance (Nuryadi et al., 2017). The criteria for homogeneity testing are if it is significant > 0.05 then the data can be said to be homogeneous or the research data group has the same variance (Basuki, 2015).

The homogeneity test was carried out using SPSS 25 software where the data used in the homogeneity test were post-test scores from the control class and experimental class. The homogeneity test results are in the following table:

**Table 3**  
Homogeneity test results based on program.

	Mean	Sig.
Pre test	38	0.286
Post test	38	0.177

Source: Processed data, researcher, 2023.

Based on the results of the homogeneity test based on gender, it can be seen that the significance value of the homogeneity test results in the pretest is 0.667 and in the post-test is 0.620, where this value is more than 0.05, so it can be concluded that the sample in the study is homogeneous or the research data group has the same variance.

**Table 4**

One way ANOVA test results for program differences.

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	24304.900	1	24304.900	4.251	.046
Within Groups	217244.440	38	5716.959		
Total	241549.340	39			

Source: Processed data, researcher, 2023.

## Hypothesis

The one-way ANOVA test in this study was used to determine whether there was a difference in the effect between the foam roller program and elastic theraband stretching on lower body flexibility.

Based on the results of the one-way ANOVA test, it can be seen that the calculated F value of the difference in the effect between the foam roller and elastic theraband stretching on lower body flexibility is 4.251 with a significance of 0.046 where the calculated F value is greater than the F table (4.10) and the sig is less from a probability of 0.05 so it can be concluded that there is a difference in the influence of the two programs used. Therefore, it can be concluded that the hypothesis (H1) that there is a difference in the influence between the foam roller and elastic theraband stretching on lower body flexibility is accepted.

## Discussion

Flexibility as a component of physical and/or athletic performance plays an important role in improving performance in games and sports. Certain elements of athletic ability are also important for successful game or sport performance, as game or sport performance cannot rely solely on flexibility. In addition to being directly related to improved performance through skill acquisition, this function also indirectly contributes to the development of other important athletic components: strength, speed, and endurance. Its role in minimizing injuries and reducing energy expenditure during exercise is undeniable. The supposed flexibility exercises recommended for athletes will greatly help increase the Flexibility of all important muscles of the body ensures improved performance. When choosing agility exercises, you should pay attention to the sequence of movements of the skill and the muscles involved in performing certain movements of the selected game or sport (Rahman, 2020). This shows that the body flexibility of program participants who use the elastic theraband is higher than those who use the MFR foam roller, but this difference is not very significant. In

previous research conducted by (Bakar et al., 2020) The purpose of the study to compare the impacts of myofascial discharge utilizing froth rolling (MFR) and resistance band-assisted extending (RB) on lower body quality and adaptability in Malaysian rugby players. The data generated showed no significant differences in right and left leg peak reaction jump performance and compound Y balance test range when compared between the three warm-up routines. In another study that compared stretching in the form of high knee and straight leg running with MFR using a foam roller on running speed in soccer players, it was found that both could increase running speed. Training a combination of conventional stretching and static stretching plus SMR using FR on the hamstring muscles can increase the range of motion of the knee joint which is an indication of good flexibility in the muscles when running because there is a balance between the strength of the knee extensor muscles and the stretching of the knee flexor muscles during extension movements. knee during late swing towards foot strike (Zuhadawa, 2020). In research conducted by (Junker, 2015) who researched the effects of foam rollers and relaxed stretching holds on hamstring flexibility, results were obtained that both increased flexibility in the hamstrings, Similar to the CRPNF group, the FOAM group also showed an increase in ROM. There are many mechanoreceptors in the fascia. These are sensory terminals that respond to pressure and tension. Golgi receptor stimulation is thought to be important for myofascial relaxation during foam rolling. Stimulating Golgi receptors hinders muscle shaft action and decreases muscle pressure. This phenomenon is called self-control. Stretching allows athletes to optimally learn, practice, and perform different types of skillful movements. Flexibility also increases an athlete's mental and physical relaxation. It promotes the development of body awareness, reduces the risk of joint sprains, strains, back problems, and muscle pain and strains. There is no doubt that stretching exercises are designed to prevent injury and improve performance in many sports. However, pure stretching exercises should not be considered a solution. To increase flexibility, we also

recommend using the following stretching exercises: Proprioceptive Neuromuscular Facilitation (PNF), Nordic Hamstring Curls (for the hamstring muscles), and Total Resistance Exercises (TRX).

Sensory receptors related to stretching that have implications for stretching and maintaining optimal ROM are muscle spindles, Golgi muscle tendons and articular mechanoreceptors in joints. Stretching activates nerve cells and muscle cells by changing their electrical charge. Electrical signals cannot pass from cell to cell, so neurons communicate with other neurons and with muscle cells by releasing special chemicals called neurotransmitters. Neurotransmitters work by activating positive sodium ions to enter the cell and cause the resting membrane potential to become more positive. When the resting membrane potential reaches the threshold potential (usually -62 mV), the cell becomes excited or active. Activated nerve cells release other neurotransmitters to activate other nerves, causing the activated muscle cells to contract. When the muscle contracts, it creates tension on the tendon and GTO (Kokkonen & Nelson, 2007).

Comparing of the impacts of MFR with foam roller and stretching with elastic theraband were both significant in increasing lower body flexibility and in this study stretching with elastic theraband was more significant in increasing lower body flexibility than myofascial release with foam roller, even though the scores were different. There's not much difference between the two. This shows that the body flexibility of female program participants is more flexible than that of men. In the study "Sit and Reach Test Based on Age, Gender, Joint Disease and Waist Hip Ratio (RLPP) at Ages 15-59 Years in Duren Sawit Subdistrict, East Jakarta in 2012" conducted by (Waluyo et al., 2013). It stated that the ability of flexibility in the gender group showed that women were higher (53.2%) than men (46.8%), from the gender group it could be seen that more women had normal flexibility. This is consistent with that statement women's flexibility is better than men. Corbin et al. (2013) said that as a general rule, girls could be more flexible than boys. Although scientific evidence is limited, some authors suggest that the benefits of flexibility for women may last a lifetime. In the absence of experimental data, it seems reasonable to conclude that there are differences in normal anatomy and/or functioning between the sexes. It may explain the differences in flexibility that may exist between the sexes. However, this flexibility ability in women tends to decline more quickly than the flexibility ability of men.

## Conclusion

There is a difference in the effect of providing myofascial release using a foam roller and stretching using an elastic theraband on lower body flexibility. Stretching using an elastic theraband resulted in a higher effect compared to myofascial release with a foam roller, although the difference between the two was not very significant. for the female gender in this study had better flexibility than the male gender. And finally, there is an interaction between the foam roller and the elastic theraband.

## Acknowledgments

Thank you to my 1st supervisor, Prof. Muhsin Doewes and my 2nd supervisor, Dr. Febriani Fajar Ekawati who has guided this research. Thank you to the students who helped becomes the subjects of this research. And also, we, the researchers, would like to express our thanks to all parties who have helped.

## Conflict of Interest

This research was carried out smoothly and successfully, and did not cause conflict from any party.

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