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Compare The Effect Of Iastm And Stretching On Muscle Tightness For Shoulder Flexibilty In Gym Goers

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Abstract
Introduction: The goal of addressing muscle tightness in gym-goers is to enhance performance, reduce discomfort, and prevent injury. Muscle tightness can result from several factors, including repetitive use, poor recovery, improper form, and muscle imbalances. When muscles are tight, they may limit range of motion, hinder strength output, and increase the risk of overuse injuries. Tight muscles can limit flexibility and range of motion, making it harder for individuals to perform exercises with proper form. This restriction can lead to compromised movement patterns, reduced efficiency during workouts, and possibly even poor posture. It can impact exercises like squats, deadlifts, and overhead presses, where full ROM is important for effectiveness and safety. Tight muscles are more prone to strains, tears, and injuries because they lack the elasticity to absorb stress. If the muscle is stiff, it's less able to respond to sudden movements or force, leading to a higher likelihood of injury during training. A muscle pull or tear can sideline gym-goers for weeks, hindering their fitness progress.
Objective: The objective of this study is to evaluate the impact of pectoralis muscle release using the IASTM tool on shoulder flexibility in the gym-going population.This study seeks to compare the impact of the IASTM tool on pectoralis muscle release for improving shoulder flexibility with the effects of stretching the pectoralis muscles. The results will help in preventing injuries and promoting better shoulder flexibility.
Methods: The methods used in this study aim to assess the effectiveness of self-stretching of the pectoralis muscle and IASTM tool release on shoulder flexibility in the gym-goer population. Based on the inclusion and exclusion criteria, individuals who meet the requirements for the study will be selected as participants. The subjects will be divided into two groups: one group will receive IASTM tool release on the pectoralis muscle (30 subjects), and the second group will perform self-stretching of the pectoralis muscle (30 subjects). Pre- and post-treatment measurements will be taken using Apley's Test, and the results will be recorded for analysis.
Results: After pre and post reading we compare the effectiveness of treatment for shoulder flexibility in gym goers to check which is more effective and find out the conclusion of the study that IASTM tool release of pectoralis muscle is more effective in gym goers on the aspect of shoulder flexibility as compare to self-stretching of pectoralis muscle.
Conclusion: The study concluded that both techniques had a beneficial effect, but the IASTM tool demonstrated greater effectiveness compared to static stretching in enhancing shoulder flexibility and alleviating tightness in the pectoralis muscles in gym-goers.

Introduction

Muscle tightness is a common sensation experienced by individuals engaged in physical activity, particularly in those who regularly exercise or go to the gym. It refers to the feeling of stiffness or tension in the muscles, often accompanied by discomfort or limited range of motion. While occasional muscle tightness can be a natural response to physical exertion, persistent or severe tightness may indicate an imbalance, improper technique, or overexertion.[1] Understanding the causes and management of muscle tightness is essential for maintaining a healthy and effective exercise routine. With the right approach, individuals can reduce the risk of tightness, enhance flexibility, and ensure faster recovery after workouts. Addressing muscle tightness proactively helps to improve overall workout efficiency and supports long-term fitness goals.

Muscle tightness is a common issue for people who regularly work out in the gym. It can occur as a result of various factors during or after exercise, impacting performance, mobility, and overall comfort. For gym-goers (often called gymers), muscle tightness is usually a result of intense physical exertion or a combination of factors, including improper technique, insufficient warm-up, and poor recovery practices[2].

IASTM is a therapeutic technique that uses specialized tools to help treat soft tissue injuries, muscle tightness, and myofascial pain. The technique involves using handheld instruments made from materials like stainless steel, plastic, or ceramic to apply controlled pressure to areas of the body affected by muscle tightness, scar tissue, or adhesions. IASTM

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tools are a highly effective method for addressing muscle tightness and promoting muscle recovery in gym-goers. By increasing blood flow, breaking down adhesions, and improving tissue mobility, IASTM can alleviate discomfort, reduce muscle stiffness, and enhance flexibility. However, it should be combined with other recovery strategies and used under the guidance of a qualified practitioner to maximize benefits and prevent injury[3].
Stretching is a widely practiced and effective way to relieve muscle tightness. It involves lengthening the muscles and tendons to improve flexibility, reduce stiffness, and enhance the range of motion. For gym-goers, regular stretching plays a crucial role in preventing and managing muscle tightness, especially after intense workouts or physical activity.[4]
Stretching is an effective, non-invasive technique to reduce muscle tightness, enhance flexibility, and improve overall muscle function. By incorporating regular stretching into your routine, whether through static or dynamic stretches, you can alleviate tightness, increase mobility, and reduce the risk of injury. Additionally, stretching helps with muscle recovery, ensuring that gym-goers can perform at their best while maintaining long-term physical health.[6]
About 50% of the human body is muscle tissue. The human body contains approximately 650 muscles, of which 430 are considered purposeful. Muscles are essential for numerous bodily functions, including enabling movement of the body and its extremities, maintaining posture, and protecting internal organs, nerves, and blood vessels. Additionally, muscles play a key role in regulating orifices, facilitating peristalsis, controlling blood flow, and assisting in the regulation of body temperature.Muscle tissue can be either voluntary / involuntary, and there are three types of muscles: cardiac, smooth, and skeletal.[3]
Skeletal muscles exhibit various shapes and arrangements of muscle fibers, which influence their function. The types of muscle fibers include long fibers, such as those found in longitudinal, strap, or fusiform muscles, and shorter fibers, seen in pennate muscles, which can be unipennate, bipennate, or multipennate. Pennate muscles are capable of generating greater force than longitudinal muscles, while longitudinal muscles have the advantage of being able to shorten over a larger distance.
Concentric contraction, also referred to as positive contraction, happens when muscles produce sufficient force to overcome inertia and lift a load. In concentric contraction, the muscle shortens as it generates enough force to pull the insertion toward the origin. This type of contraction occurs during the lifting phase in resistance training. In contrast, eccentric contraction involves the muscle lengthening as it controls the lowering of the weight back to the starting position; it is also known as negative contraction. Isometric contraction is a static contraction where there is no shortening of the muscle and no visible movement of the body or limb. In this type of contraction, the muscle's insertion and origin points remain unaffected by each other. Examples of isometric contractions include holding a weight stationary or attempting to lift a heavy weight without any movement.[4]
In resistance training, it's essential to target all muscle groups to ensure balanced development. A well-rounded program should include exercises for every muscle group, as maintaining muscular balance is vital for proper coordination and posture. Poor muscular balance can lead to an increased risk of injury during exercise. If certain muscle groups are underdeveloped, the focus should shift to strengthening the weaker muscles. Resistance training can be categorized into key muscle groups: the core (including the abdomen and lower back), thigh muscles, chest muscles, shoulder muscles, upper back muscles, and upper arm muscles.[4]
Before exercising, the body should be warmed up with low-impact aerobics activities like cycling, rowing, or walking. The intensity should be enough to induce light sweating, and the warm-up should last around 5-10 minutes. Following the warm-up, light and brief stretches can be done, but it's important to first warm up the main muscle groups before beginning the actual workout. The purpose of the warm-up is to increase blood flow to the muscles, helping them contract more effectively. Warming up not only reduces the risk of injury but also enhances the body's optimal performance and supports controlled movement during exercise.[4, 5]
Delayed onset muscle soreness (DOMS) is a condition that typically occurs 12-48 hours after exercise, resulting in muscle soreness or stiffness. It is commonly experienced when starting a new exercise program, altering your routine, or increasing the intensity or duration of physical activity. DOMS is a normal part of the body's adaptation process, contributing to strength gains, muscle hypertrophy, and overall muscle recovery. The soreness is usually most intense within the first two days after exercise and gradually subsides over the next few days, though it can sometimes persist for up to two weeks.[6]
Several theories explain DOMS. It may be caused by microscopic tears in the muscle fibers, or it could result from an abnormal accumulation of metabolites (e.g., calcium) in the muscle cells, leading to further cell damage. The degree of soreness and tearing depends on the type and duration of the exercise. In addition to muscle tearing and metabolite buildup, swelling and inflammation in the muscle can also contribute to soreness. Eccentric muscle contractions, particularly muscle lengthening (e.g., the downward motion of a squat), seem to cause the most soreness. However, eccentric contractions are also associated with greater muscle strengthening and growth.[6]
Muscle soreness of the pectoralis major was evaluated using a visual analog scale (VAS), where "no pain" was marked at one end of a 100-mm line and "extremely sore" at the other. The assessment was conducted during muscle palpation, in which the investigator applied pressure to the medial part of the pectoralis major using the tips of three fingers (II, III, and IV) for approximately 3 seconds.[7]

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In individuals with shoulder impingement syndrome (SIS), changes in scapular kinematics are believed to result from pectoralis minor (PM) tightness, posterior capsule tightness, altered activity of the scapular and rotator cuff muscles, and/or repetitive overhead movements. The PM is unique as the only scapulothoracic muscle with both its origin and insertion located anterior to the scapula. The fiber orientation of the PM promotes scapular internal rotation (IR), downward rotation, and anterior tilt (AT), making it an antagonist to the necessary scapular motions during arm elevation. In contrast to individuals with longer PM muscles, healthy individuals with shorter PM muscles exhibit increased scapular IR and reduced scapular posterior tilt (PT) during arm elevation. These changes in scapular movement patterns highlight a possible link between PM shortening and SIS.
IASTM treatment is thought to stimulate connective tissue remodeling by promoting the resorption of excess fibrosis and encouraging the repair and regeneration of collagen through fibroblast recruitment. This process helps to release and break down scar tissue, adhesions, and fascial restrictions, ultimately improving tissue mobility and function.[9, 10]
Maintaining an adequate range of motion (ROM) in muscle-joint complexes is essential for both athletes and non-athletes across all age groups. The health and performance consequences of insufficient flexibility are well understood. However, recent research has questioned several commonly held beliefs, such as the idea that pre-exercise static stretching enhances power performance and reduces injury risk, suggesting there is still much to be explored in this area. One aspect that has received limited attention is the impact of resistance training (RT) on flexibility. Fifty years ago, it was widely believed that muscle hypertrophy led to being "muscle-bound," and numerous studies were conducted to examine this concept.[11]
The aim of this study is to compare the effects of the IASTM tool on pectoralis muscle release and the effects of stretching on pectoralis muscles for improving shoulder flexibility.

Objective
To determine the effect of pectoralis muscle release using the IASTM tool on shoulder flexibility in the gym-going population.
The objective of this study is to assess the impact of stretching the pectoralis muscle on shoulder flexibility in individuals who engage in regular gym activities.

Null Hypothesis
There is no significant effect of pectoralis muscle release using the IASTM tool or the stretching of the pectoralis muscle on shoulder flexibility in the gym-going population.

Alternative Hypothesis
There is a significant effect of pectoralis muscle release using the IASTM tool and the stretching of the pectoralis muscle on shoulder flexibility in the gym-going population.

Methodology
Sixty subjects were recruited and divided into two groups, each consisting of 30 participants.
Group A: Thirty for IASTM
Group B: Thirty for stretching
Convenience sampling method was done to fulfil the inclusion and exclusion criteria.

Inclusion Criteria
Gym goers or gym going population having minimum 1 year experience.
Males
Ranging of age between 20 to 35 years.
Subjects with past experience of shoulder Range of Motion (ROM) Restriction.

Exclusion Criteria
Subject with any fracture of upper limb.
Any major surgery which might hamper physical activity.
Subject having any neurological problems.
Upper extremity musculoskeletal injury.
Any history of shoulder injury.

First, review the inclusion and exclusion criteria, and then have the subjects sign the informed consent form after explaining the protocol. It is important to inform the participants about the entire procedure of the study using clear and simple language, or in the local language. Once the subjects confirm their understanding, proceed with the procedure.

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Next, assess shoulder flexibility using the Apley's Scratch Test for both shoulders, before and after the intervention, with the same tester performing all measurements. If the subject is unable to touch their fingers together, or if the subject exhibits a positive Apley's maneuver, measure the gap between the fingers using an inch tape.

Figure 3.6 Apley's maneuver

- The inch tape should start at the tip of the middle finger on one hand (above extremity) while the shoulder is in flexion, external rotation, and scapular abduction. The tape should then extend to the tip of the middle finger on the other hand (lower extremity) while the shoulder is in extension, internal rotation, and scapular adduction.

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Figure 3.7 measurement of the gap between both hand fingers

- In this study, we have two separate groups: one group undergoes IASTM, and the other follows a static stretching protocol.
- First, assess the skin condition to check for any contraindications. Then, test the hot and cold sensations of the individual using hot and cold test tubes or cotton swabs. Next, apply a hot pack for 10-12 minutes to soften the underlying tissues, increase blood supply, and provide warmth to the area. After the application of the hot pack, perform soft tissue mobilization using the IASTM tool on both the minor and major of pectoralis muscle bellies. Before using the IASTM tool, ensure that the skin is free from any open wounds or abrasions, and that any hair has been trimmed, shaved, or waxed. Also, apply IASTM cream or another lubricant to reduce friction and facilitate smooth movement of the tool.
- After the IASTM mobilization, apply a cold pack for 3-5 minutes to achieve vasoconstriction, which helps reduce bleeding into the minor or superficial capillaries. This treatment is performed three times a week on alternate days.

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Figure 3.8 IASTM (Instrumented Assisted Soft Tissue Mobilisation) on pectoralis muscle

- The static stretching of the chest or pectoralis muscles will be performed for one week on alternate days, without a pre-warm-up session. During the static stretching of the pectoralis muscles, the subject will be taught how to properly perform the stretch, holding it for a minimum of 20-30 seconds, repeating it 2-3 times each. The subject will perform the stretching routine on alternate days, both before and after their training sessions.
- Shoulder flexibility will be assessed before and after training using the inch tape method, following Apley's manoeuvre.

Figure 3.9 Pectoralis Strecthing (Edge of Wall)

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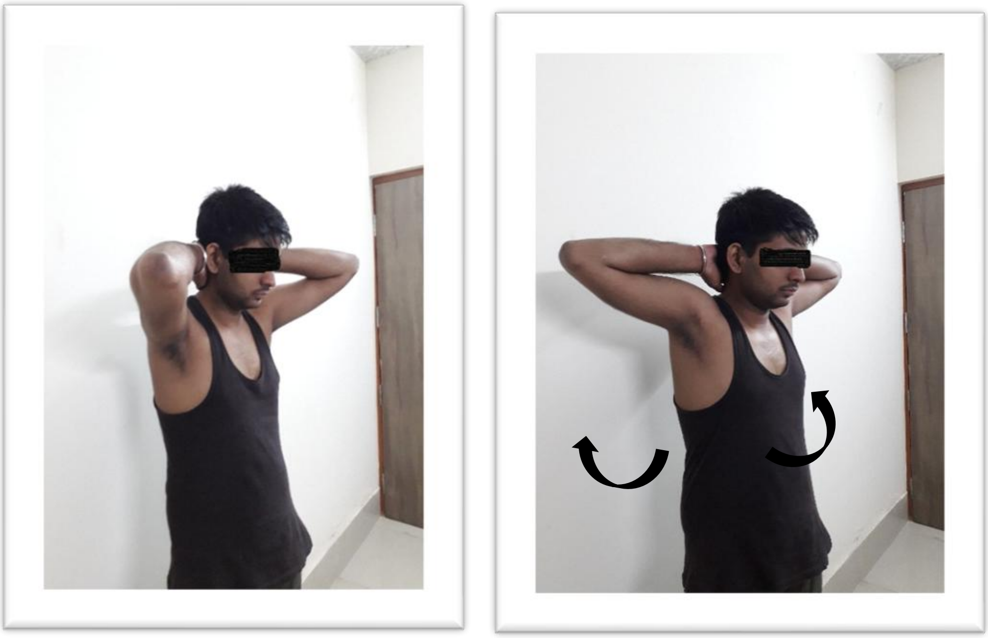

Figure 4.0 Pectoralis Strecthing (Self)

Both elbows away from body
Data analysis was performed by using Microsoft excel 2016 for window 10 software importing master sheet containing data of subjects. Descriptive statistics was used for analysis and to find-out mean and standard deviation of test readings of IASTM techniques used for the shoulders flexibility in different weeks.

WEEKS	ARM	PRE	POST
1ST	LEFT	12.25 ± 7.82	8.36± 6.23
	RIGHT	8.36 ± 6.23	5.33 ± 5.43
2ND	LEFT	9.88 ± 7.11	6.25 ± 5.43
	RIGHT	6.25 ± 5.43	3.16 ± 4.55

Data analysis was performed by using Microsoft excel 2016 for window 10 software importing master sheet containing data of subjects. Descriptive statistics was used for analysis and to find-out mean and standard deviation of test readings of Stretching used for the shoulders flexibility in different weeks.

WEEKS	A	PRE	POST
1ST	LEFT	14.93 ± 7.10	12.41 ± 6.36
	RIGHT	12.41 ± 6.36	11.8 ± 7.11
2ND	LEFT	14.3 ± 6.34	12.2 ± 5.77
	RIGHT	12.2 ± 5.77	11.7 ± 6.18

Results
The charts show a moderate to high statistical correlation between the effects of the IASTM tool and static stretching on muscles within the gym population. Additionally, they indicate that the IASTM tool technique was more strongly associated with improvements in shoulder flexibility than static stretching of the pectoralis major and minor muscles.

- While both techniques were found to improve shoulder joint flexibility, the IASTM tool showed more significant results.

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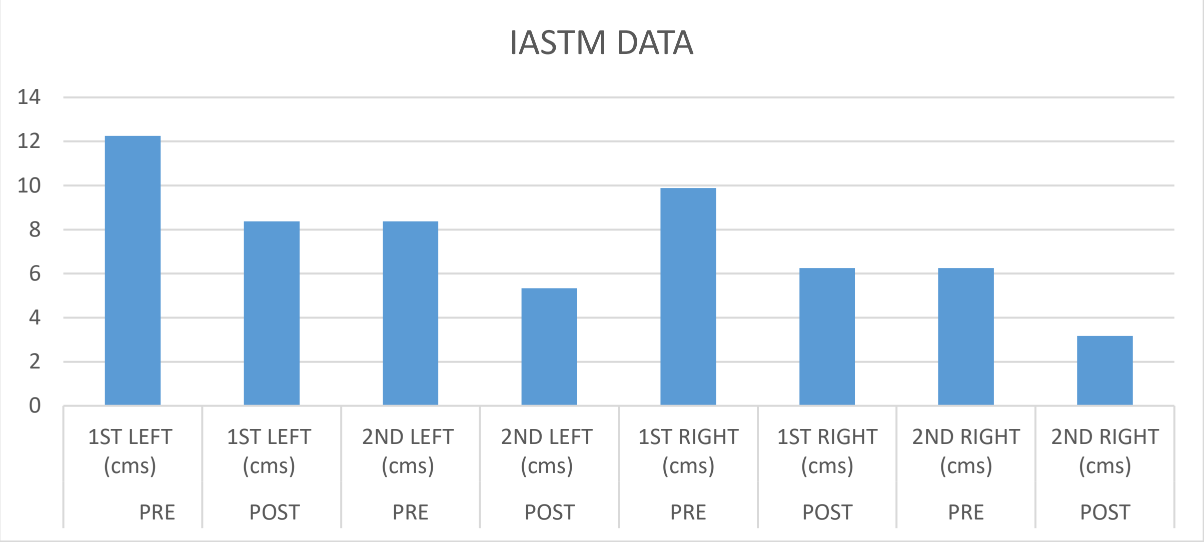

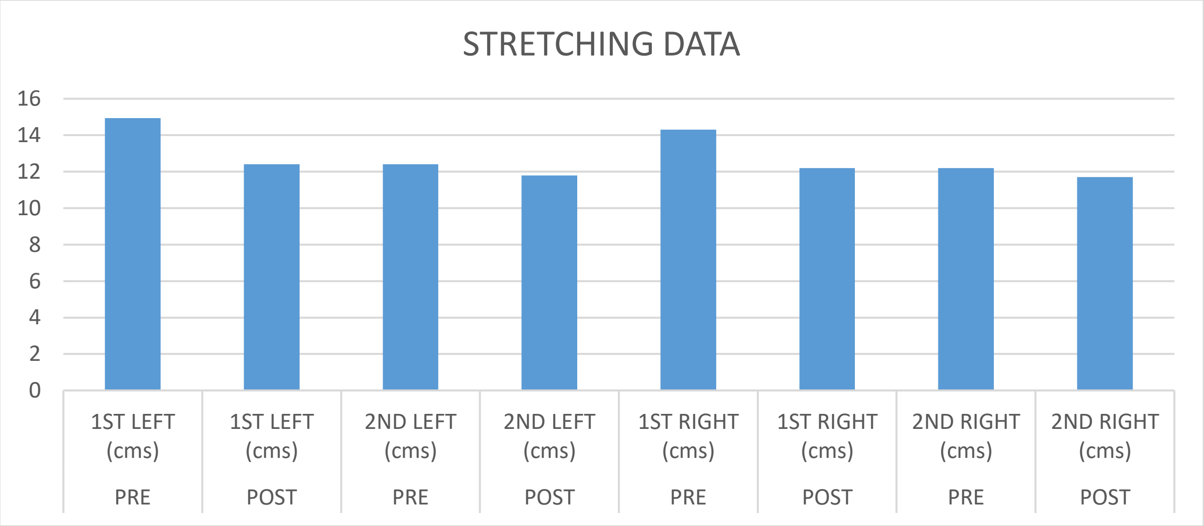

Discussion

- In this conducted study there was a statistical significant comparison between both the groups and both are showing the positive impact over the shoulder flexibility whereas the iastm is more effective than stretching for such interval of time.
- Mean percentile(IASTM) for: left hand =-0.0376%; right hand=-0.0306%.
- Mean percentile(Stretching) for: left hand=-0.0231%; right hand=-0.005%.

Therefore, the mean percentile of IASTM is more negative than the stretching percentile so the IASTM Technique is more effective in the tight pectoralis release or improve shoulder flexibility in gym goers.

- The findings of this study indicate that the IASTM tool technique is primarily linked to the release of the pectoralis muscles and enhancements in shoulder flexibility.
- Data of 60 participants was collected during weight training or strength training.
- Though, some participants are not done the stretching protocol willingly, they said this causing weird feel and painful to perform this.
- Few of them are not do the stretching exercises they evasion to do it.

Conclusion

The study concluded that while both techniques had a positive effect, the IASTM tool was more effective than static stretching in addressing pectoralis muscle tightness and shoulder flexibility issues in gym-goers.The IASTM tool is more effective because it is ergonomically designed, made of stainless steel, and features a laser-cut design, making it easier to maneuver with minimal risk of skin rupture.The IASTM tool is specifically designed for soft tissue mobilization, requiring less mechanical strength from the practitioner, while still delivering highly effective results.

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