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The Effect of Myofascial Release on Post Exercise Recovery in Young Athletes

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ABSTRACT: Every athlete has got a goal in life, and they work hard to achieve it. Sports performance has four major dimensions – skill, strength, endurance and recovery. Recovery after exercise is essential for the muscles and tissues to repair and build strength. Active recovery (AR) is the most common technique used in the sports field. In active recovery warm up, cool down and rest are the common techniques used by the coaches. Myofascial release (MFR), a hands-on therapeutic approach targeting the fascial system to alleviate muscular tension, restore tissue mobility, improve overall functional capacity and enhance the recovery. Sixty athletes who fulfilled the inclusion criteria were selected and divided into two groups i.e., Control group and experimental group using simple random sampling method. Control group followed general regular warm up and Experimental group received Myofascial release (MFR)combination of along with their regular warm up. Pre and post assessment of the participant's perceived fatigue was recorded after 1 minute and then after 3 minutes when the participants used the treadmill test up to 80% of maximum heart rate. At end of the study though conventional group showed recovery, Experimental group who received warm up along with Myofascial release showed better result compared to the conventional group. Blinding participants and assessors to MFR challenges due to direct contact and manipulation, potentially leading to a placebo effect based on beliefs or expectations.

Keywords: Post exercise recovery, Active recovery, Myofascial release, Maximum Heart rate, Perceived Fatigue.

INTRODUCTION

In the world of sports, optimizing recovery strategies plays a vital role in enhancing athletic performance and reducing the risk of injuries. As athletes push their bodies to the limit, the accumulation of physical stress, muscular imbalances, and myofascial restrictions can impede recovery processes and hinder overall athletic progress. Therefore, exploring effective techniques to promote recovery becomes essential. One such technique gaining significant attention is myofascial release (MFR), a hands-on therapeutic approach targeting the fascial system to alleviate muscular tension, restore tissue mobility, and improve overall functional capacity.

The fascial system, a complex network of connective tissue that surrounds and interconnects muscles, bones, and organs, has been recognized as an integral component influencing movement patterns, force transmission, and proprioception (Schleip *et al.*, 2005). Myofascial restrictions, characterized by adhesions, tension, and trigger points within the fascial system, can impair muscle function, restrict joint mobility, and contribute to the development of musculoskeletal disorders (Schleip *et al.*, 2003). Therefore, interventions that directly address myofascial restrictions have the potential to positively impact athletes' recovery and performance outcomes.

Several studies have investigated the effects of myofascial release techniques on various aspects of athlete recovery. A study by (Ajimsha *et al.*, 2012) demonstrated that myofascial release intervention significantly reduced muscle soreness and improved range of motion in basketball players after intense training sessions. Furthermore, (Healey *et al.*, 2014) found that myofascial release techniques reduced perceived fatigue and enhanced muscular power output in rugby players following high-intensity exercise. These findings suggest that MFR interventions may have the potential to expedite recovery processes and optimize athletic performance.

Fascia damage in sports and recreational exercise can cause performance deficits, musculoskeletal disorders, and pain. This paper discusses molecular responses, physiological challenges, imaging techniques, and therapeutic interventions in sports medicine (Kodama *et al.*, 2023).

The study compared myofascial release with Findings-Oriented Orthopedic Manual Therapy (OMT) and Foam Roller on university athletes' physical performance, finding that OMT combined with FR improved ROM,

muscle power, strength, and flexibility (Afanador-Restrepo *et al.,* 2023)

Self-myofascial release (SMR) instruments, like foam rollers and roller massagers, are used in sports to improve performance and recovery. A systematic review found no major adverse effects beyond pain, and the effects varied depending on time, pressure, and instrument characteristics. Overall, SMR instruments can be a safe intervention for sports performance and recovery (Ferreira *et al.,* 2022).

Despite these promising results, further research is needed to establish a more comprehensive understanding of the effects of myofascial release on athlete recovery. This research article aims to contribute to the existing body of knowledge by investigating the specific impact of myofascial release techniques on recovery markers, such as muscle soreness, range of motion, perceived fatigue, and functional performance, in a cohort of elite athletes. By elucidating the potential benefits of myofascial release in facilitating recovery, this study seeks to provide evidence-based recommendations for incorporating MFR interventions into athletes' recovery protocols.

In conclusion, optimizing recovery strategies is of paramount importance for athletes seeking to maximize their performance potential. The myofascial release technique emerges as a promising approach for addressing myofascial restrictions and promoting efficient recovery processes. This research article aims to shed light on the effects of myofascial release on athlete recovery, ultimately aiding in the development of targeted interventions that can enhance athletes' overall well-being and performance.

MATERIAL AND METHODS

Study Design: A randomized controlled trial (RCT) was conducted to investigate the effect of myofascial release (MFR) on the recovery of athletes. The RCT design was chosen to establish causal relationships between the MFR intervention and recovery outcomes.

Participants: A total of 60 elite athletes (male and female) between the ages of 18 and 25 were recruited for the study. Inclusion criteria included a minimum of two years of competitive sports experience and the absence of any musculoskeletal injuries or conditions that would impede participation in the study.

Intervention: Participants were randomly assigned to either the myofascial release group (n=30) or the control group (n=30). The myofascial release group received a standardized MFR intervention targeting key muscle groups and fascial restrictions. The intervention was performed by the researcher and consisted of manual techniques such as sustained pressure and stretching.

Outcome Measures: Recovery outcomes were assessed pre- and post-intervention using validated measures. The outcome measure was: Perceived fatigue: Assessed using a fatigue scale questionnaire, such as the Multidimensional Fatigue Inventory (MFI), to quantify subjective levels of fatigue.

Procedure: The selected subjects were divided into two equal groups (Control group and Experimental group). The pre-test scores were collected from both the groups after running in the treadmill till they reached 80% of their maximum heart rate after 1 minute & after 3 minutes. The control group received Warm up exercises and the Experimental group received Myofascial release along with the Warm-up exercises for two weeks. The post test scores were collected at the end of second week like that of the pre-test procedure.

FIFA 11+ warm up protocol was followed for both the groups. The experimental group received self-myofascial release techniques utilising a regular tennis ball or foam roller. The athletes were instructed to roll the plantar fascia with a tennis ball while standing. From a supine body position, the rolling progression focused on the gluteal region (gluteus maximus, gluteus medius, gluteus minimus), thoracic/lumbar region (erector spinae, multifidus), hamstring region (semitendinosus, semimembranosus, biceps femoris), and calf region (gastrocnemius, soleus). The quadriceps (rectus femoris, sartorius, psoas major, and iliacus) were then followed by the pectoral region (pectoralis major, pectoralis minor) from the prone body posture. Every 30 seconds, each muscle group was rolled around its whole surface five times. Each technique was applied bilaterally.

Data Collection: Data collection was conducted at baseline pre-test and post-test after two weeks of intervention. Participants were instructed to refrain from any strenuous physical activity for 24 hours before each assessment to ensure consistency.

Statistical Analysis: Descriptive statistics (mean, standard deviation) were calculated for the outcome measure. To compare the effects of MFR on recovery outcome between the groups, paired t test and independent t-tests were used. Statistical significance was set at $p<0.05$.

RESULTS AND DISCUSSION

Warm up exercises were significantly effective in reducing the perceived fatigue among the athletes. Myofascial release along with Warmup exercises was significantly effective in reducing the perceived fatigue among the athletes. Myofascial release along with Warmup exercises was significantly more effective in reducing the perceived fatigue than warm up alone among the athletes.

Table 1: Paired 't' test value for the control group- Warmup.

Variable	t - cal value	t - tab value
Perceived fatigue	3.241	1.697

"t" calculated value > "t" table value; Significant at 0.05 level

Table 2: Paired 't' test value for the experimental group-Self-myofascial release with warm up.

Variable	t - cal value	t - tab value
Perceived fatigue	8.922	1.697

"t" calculated value > "t" table value; Significant at 0.05 level

Table 3: Independent 't' test value for control group and experimental group-Warmup Vs Self myofascial release.

Variable	t - cal value	t - tab value
Perceived fatigue	4.173	1.671

"t" calculated value > "t" table value; Significant at 0.05 level

Myofascial release is significantly effective in decreasing the perceived fatigue of the Athletes. Using foam rolling for self-myofascial release has been shown to have numerous beneficial therapeutic effects (e.g., increased vascular plasticity and soft tissue regeneration) on performance and recovery in a variety of sports. In response to foam rolling self-myofascial release, there is an increase in myogenic and endothelial dilation, as well as an increase in NO2. In addition to serving as a mood enhancer, it also potentiates exhaustion, making it a useful ergogenic aid.

The reduction of spasms, the breaking up of adhesions, the increase in blood flow, and the lymphatic drainage all contributed to the improvement in soft tissue extensibility. Fascia's thixotropic qualities, which allow it to soften when disturbed, have also been postulated as a possible explanation for greater soft tissue extensibility. This may be due to the ground substance being less viscous as a result of the manipulation of soft tissues.

Deep sustained pressure is believed to activate the autonomic nervous system by stimulating Ruffini endings in the fascia, which respond to deep sustained pressure. Proponents of SMR say that activating these receptors lowers the overall sympathetic tone, increases gamma motor neuron activity, and promotes the relaxing of intra-fascial smooth muscle cells, among other effects (Wiktorsson-Möller *et al.*, 1983). Also believed to be the case is that the autonomic nervous system stimulated vasodilation and local fluid dynamics, which altered the viscosity of fascia by transforming the ground substance into a more gel-like condition.

Allegedly, the combination of these effects will produce a perceptible release of the trigger point while simultaneously improving muscular function (Barnes, 1997, Schleip 2003). The stimulation of the mechanoreceptors causes the autonomic nervous system and the central nervous system to become active at the same time. Because of the localized pressure, the central nervous system responds by reducing the tonus of adjacent striated muscle fibres, which in turn contributes to the release felt after applying SMR to the affected area (Mohr *et al.*, 2014).

CONCLUSIONS

The findings of this research support the inclusion of Myofascial Release (MFR) techniques in warm-up routines to optimize recovery and reduce perceived fatigue in athletes. This approach has the potential to enhance the overall functional capacity and performance of athletes across various sports disciplines. Future studies should explore the long-term effects of MFR on recovery and performance, as well as its applicability to different athlete populations and specific sports contexts.

FUTURE SCOPE

The effect of myofascial release on post-exercise recovery in young athletes is wide-ranging. By addressing these areas, we can enhance our understanding, improve treatment protocols, and optimize the application of myofascial release in sports medicine and athletic performance.

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Conflict of interest. None.

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