

ISSN Print: 2664-844X
ISSN Online: 2664-8458
NAAS Rating (2026): 4.97
IJAFS 2026; 8(11): 230-232
www.agriculturaljournals.com
Received: 24-09-2026
Accepted: 26-10-2026
Published: 05-11-2026

Nzhuyhun Seb
Department of Physiotherapy, Sam Higginbottom University of Agriculture, Technology and Sciences, Prayagraj, Uttar Pradesh, India

Sanjay Kumar
Department of Physiotherapy, Sam Higginbottom University of Agriculture, Technology and Sciences, Prayagraj, Uttar Pradesh, India

Surabhi Srivastava
Department of Physiotherapy, Sam Higginbottom University of Agriculture, Technology and Sciences, Prayagraj, Uttar Pradesh, India

Corresponding Author:
Nzhuyhun Seb
Department of Physiotherapy, Sam Higginbottom University of Agriculture, Technology and Sciences, Prayagraj, Uttar Pradesh, India

Effectiveness of active release technique compared with myofascial release for hamstring strains in football athletes: A randomized clinical trial

Nzhuyhun Seb[1], Sanjay Kumar[2], Surabhi Srivastava[3]

DOI: https://www.doi.org/10.33545/2664844X.2026.v8.i11d.89923

Abstract
Hamstring strain injuries are common among football players and may lead to time away from training and competition, as well as an increased risk of recurrence. Active Release Technique (ART) and Myofascial Release (MFR) are frequently used in physiotherapy; however, their comparative short-term effectiveness in athletes with recent hamstring strains requires further investigation. This randomized clinical trial aimed to compare the effects of ART and MFR on pain intensity and hamstring flexibility in male football athletes aged 18–35 years with acute Grade I or II hamstring strains. A total of 48 participants whose injuries had occurred within the preceding 1–2 weeks were randomly allocated to either the ART group (n = 24) or the MFR group (n = 24). Both groups received six treatment sessions over two weeks, three sessions per week, along with an identical home exercise programme. Pain intensity was assessed using the Visual Analogue Scale (VAS), while hamstring flexibility was evaluated using the Active Knee Extension (AKE) test. Forty-four participants completed the study, with 22 participants in each group. The ART group demonstrated a reduction in mean VAS scores from 4.77 ± 1.11 to 1.59 ± 0.67, while the MFR group showed a decrease from 5.41 ± 1.22 to 2.18 ± 0.96. Similarly, the recorded AKE values changed from 42.45° ± 7.93 to 25.82° ± 8.59 in the ART group and from 44.05° ± 8.39 to 28.41° ±
7.25 in the MFR group. Both groups demonstrated statistically significant pre- to post-intervention changes ($p < 0.001$). However, between-group comparisons revealed no statistically significant differences in improvement for pain intensity ($p = 0.833$) or hamstring flexibility ($p = 0.318$). These findings indicate that both interventions were associated with short-term improvements in the measured outcomes, with no statistically significant superiority demonstrated by either technique. Nevertheless, the results should be interpreted cautiously because of the relatively small sample size, short intervention period, absence of long-term follow-up, and lack of an exercise-only or sham control group.

Keywords: Hamstring strain, Active Release Technique, Myofascial Release, Football, Sports physiotherapy, Flexibility

Research Paper

Introduction

Hamstring strain injury is a recurring problem in football, where sprinting, kicking, acceleration and rapid deceleration place substantial demands on the muscles at the back of the thigh. Published work has described hamstring injuries as a notable proportion of football-related injuries and has highlighted the risk of time away from sport and subsequent reinjury (Ekstrand *et al.*, 2011; Clanton & Coupe, 1998; Ribeiro-Alvares *et al.*, 2020) [1, 2].

Rehabilitation following a hamstring strain aims to reduce symptoms, restore movement and strength, and support a safe return to sport. Progressive strengthening and neuromuscular training are important elements of rehabilitation; manual soft-tissue approaches may also be used as adjuncts according to the athlete's presentation and the clinician's judgement (Prior *et al.*, 2009; Opar *et al.*, 2012) [3].

Active Release Technique (ART) involves therapist-applied contact or tension while the patient moves the involved tissue through a range of motion. Myofascial Release (MFR), by contrast, generally uses sustained, relatively low-load manual pressure. Although both approaches are used in musculoskeletal practice, the manuscript's stated research rationale is that direct comparative evidence in athletes with acute hamstring strains is limited.

This trial therefore compared ART with MFR in male football athletes with recent Grade I or II hamstring strains. The outcomes were pain intensity and hamstring flexibility measured before and immediately after a

26648458, 2026, 8(11), Downloaded from https://www.doi.org/10.33545/2664844X.2026.v8.i11d.89923 by International Journal of Agriculture and Food Science on [05/11/2026]. See the Terms and Conditions (https://www.agriculturaljournals.com) for rules of use; OA articles are governed by the applicable Creative Commons License

two-week intervention period. The study hypothesis was that both groups would improve, without a statistically significant difference between them.

Materials and Methods

Study design and participants

The study was described as a single-blind randomized clinical trial. Participants were recruited through local football academies and sports facilities. Eligibility criteria were male football athletes aged 18–35 years, a clinical diagnosis of Grade I or Grade II hamstring strain, and injury onset within the previous one to two weeks.

Exclusion criteria were a Grade III tear or a condition requiring surgery; lower-limb or spinal surgery during the previous six months; another lower-limb injury likely to affect rehabilitation; a neurological or systemic disorder affecting lower-limb function; or concurrent physiotherapy for the hamstring injury.

Allocation, blinding and ethics

After baseline testing, participants were allocated to ART or MFR using a computer-generated random-number sequence. Outcome assessors were reported to be unaware of group allocation. The manuscript states

that approval was obtained from the institutional ethics committee of Sam Higginbottom University of Agriculture, Technology and Sciences and that written informed consent was obtained from all participants before enrolment.

Intervention procedures

Each group received its assigned manual therapy three times per week for two weeks, giving six sessions in total. Sessions lasted approximately 10–15 minutes. Both groups were also given the same home exercise programme, consisting of hamstring stretching, hamstring curls and glute bridge walkouts.

ART group: The therapist applied targeted manual tension to the affected hamstring while the participant actively moved the muscle from a shortened position towards lengthening. The intended purpose was to facilitate movement between soft-tissue layers.

MFR group: The therapist applied slow, sustained, low-intensity pressure to areas of restricted muscle or fascia and maintained the pressure until a change in the tissue barrier was felt. The technique was intended to reduce guarding and improve tissue mobility.

Outcome measures

Assessments were conducted before treatment and immediately after the two-week programme. Pain intensity was measured with a 10-cm Visual Analogue Scale, anchored at 0 for no pain and 10 for the worst imaginable pain (Begum & Hossain, 2019).

Hamstring flexibility was assessed with the Active Knee Extension test. With the participant supine and the tested hip flexed to 90°, the participant actively extended the knee as far as possible. A universal goniometer was used to record the knee-flexion deficit; the source manuscript treats a lower recorded angle as indicating improved extensibility (Gajdosik & Lusin, 1983). The exact angle convention should be confirmed before publication so the reported direction of change is unambiguous.

Statistical analysis

The source manuscript reports that analyses were performed in SPSS version 26.0. Data were summarized as means and standard deviations, and the Shapiro–Wilk test was used to assess normality. Paired t-tests were used for pre–post comparisons within each group, while independent t-tests compared change scores between groups. Statistical significance was defined as $p < 0.05$.

Results

Participant flow and baseline data

Forty-eight participants were randomized, with 24 assigned to each group. Four participants did not complete the post-intervention assessment for personal reasons. The final analysis included 44 participants: 22 in the

ART group and 22 in the MFR group. The manuscript reports no statistically significant baseline differences between groups.

Changes within each group

In the ART group, the mean VAS score decreased from 4.77 ± 1.11 at baseline to 1.59 ± 0.67 after treatment (reported $p < 0.001$). The reported AKE value changed from 42.45° ± 7.93 to 25.82° ± 8.59 (reported $p < 0.001$).

In the MFR group, the mean VAS score decreased from 5.41 ± 1.22 to 2.18 ± 0.96 (reported $p < 0.001$). The reported AKE value changed from 44.05° ± 8.39 to 28.41° ± 7.25 (reported $p < 0.001$).

Variable	ART ($n = 22$)	MFR ($n = 22$)	p-value
Age (years)	22.4 ± 3.1	23.1 ± 2.8	0.442
Baseline VAS (0–10)	4.77 ± 1.11	5.41 ± 1.22	0.085
Baseline AKE (°)	42.45 ± 7.93	44.05 ± 8.39	0.516

Values are reported as mean ± standard deviation. VAS = Visual Analogue Scale; AKE = Active Knee Extension.

Group	Outcome	Pre-treatment (mean ± SD)	Post-treatment (mean ± SD)	Reported p-value
ART	VAS	4.77 ± 1.11	1.59 ± 0.67	< 0.001
ART	AKE (°)	42.45 ± 7.93	25.82 ± 8.59	< 0.001
MFR	VAS	5.41 ± 1.22	2.18 ± 0.96	< 0.001
MFR	AKE (°)	44.05 ± 8.39	28.41 ± 7.25	< 0.001

Comparison between groups

The mean reduction in VAS was reported as 3.18 points in the ART group and 3.23 points in the MFR group; the between-group comparison was not statistically significant ($p = 0.833$). The reported mean change in AKE was 16.64° for ART and 15.64° for MFR, with no statistically significant between-group difference ($p = 0.318$).

Change score	ART mean change	MFR mean change	Reported p-value
VAS	3.18	3.23	0.833
AKE (°)	16.64	15.64	0.318

26648458, 2026, 8(1), Downloaded from https://www.doi.org/10.33545/26648458.2026.v8.i1.d.89923 by International Journal of Agriculture and Food Science on [05/11/2026]. See the Terms and Conditions (https://www.agriculturaljournals.com) for rules of use; OA articles are governed by the applicable Creative Commons License

Discussion

The results reported in this trial show improvement in pain and the study's recorded AKE measure in both groups over two weeks. However, the change-score comparisons did not show a statistically significant difference between ART and MFR. The findings therefore do not establish that either approach is superior for the short-term outcomes measured in this sample.

Interpretation of the within-group changes

Both groups received manual therapy as well as the same home exercise programme. The observed pre–post changes may reflect the combined influence of the assigned technique, exercise, recovery over time, participant expectations and other factors. Because the study did not include an exercise-only, usual-care or sham group, the independent contribution of either manual therapy technique cannot be determined from these results alone.

Manual therapy is commonly used to address symptoms and movement restrictions in rehabilitation. Changes in range-of-motion measures may reflect changes in stretch tolerance or nervous-system responses as well as changes in tissue mechanics; therefore, an improvement in a flexibility test should not automatically be interpreted as structural lengthening of muscle tissue (Weppler *et al.*, 2010) [4]. The mechanisms proposed for ART and MFR in the source manuscript should be treated as possible explanations rather than mechanisms directly tested by this trial.

Meaning of the between-group findings

The reported *p*-values for VAS and AKE change scores were both above the prespecified 0.05 threshold. This means the study did not detect a statistically significant difference between the interventions; it does not prove that the two treatments are equivalent. Demonstrating equivalence or non-inferiority would require an appropriate design, a prespecified clinical margin and corresponding statistical analysis.

In practice, a clinician may consider patient comfort, clinical assessment, training and preference when choosing an adjunctive manual technique. Nevertheless, manual therapy should not be presented as a substitute for an appropriately progressed rehabilitation programme or return-to-sport assessment.

Study limitations

Several limitations should be considered. First, the final sample consisted of 44 participants, which may limit precision and the ability to detect smaller differences. Second, outcomes were recorded only immediately after the two-week intervention, so durability of the changes, time to return to sport and reinjury were not evaluated. Third, all participants were male football athletes aged 18–35 years, limiting generalization to women, other sports and other age groups. Fourth, the absence of an exercise-only or sham comparison group prevents attribution of all observed changes to the manual techniques. Finally, the manuscript does not provide confidence intervals or enough detail to independently verify all statistical calculations.

Recommendations for further research

Future trials should recruit larger samples, describe allocation concealment and assessor blinding in detail, report confidence intervals and clinically meaningful outcomes, and include follow-up beyond the end of treatment. An exercise-only or suitable control group would help estimate the additional effect of manual therapy. Return-to-sport time, functional performance and reinjury should also be measured.

Conclusion

In this trial, both ART and MFR groups showed short-term reductions in reported pain scores and changes in the recorded AKE measure after two weeks of treatment plus a common home exercise programme. The reported between-group tests did not identify a statistically significant difference. The findings support cautious interpretation: neither technique was shown to be superior, and the study design does not establish that the techniques are equivalent or that manual therapy alone caused the improvements.

References

1. Ekstrand J, Hägglund M, Waldén M. Epidemiology of muscle injuries in professional football. Am J Sports Med. 2011;39(6):1226–1232.
2. Ribeiro-Alvares JB, Dornelles MP, Fritsch CG, *et al.* Prevalence of hamstring strain injury risk factors in professional and under-20 football players. J Sport Rehabil. 2020;29(3):1–7.
3. Opar DA, Williams MD, Shield AJ. Hamstring strain injuries: factors leading to injury and re-injury. Sports Med. 2012;42(3):209–226.
4. Weppler CH, Magnusson SP. Increasing muscle extensibility: a matter of increasing length or modifying sensation? Phys Ther. 2010;90(3):438–449.
5. Ahmed S, Padhy R, Bawiskar D. Comparative effectiveness of MFR and ART in hamstring tightness. Int J Physiother Res. 2023;11(2):1–7.
6. Antohe BA, Rata M, Rata BC, Rata G. Muscle injury in sports activity – etiology, classification and treatment. Bull Transilv Univ Brasov Ser IX Sci Hum Kinet. 2022;15(2):21–28.
7. Barnes P, Rivera M. Effect of Active Release Technique on musculoskeletal conditions. J Sport Rehabil.
8. Begum S, Hossain MA. Validity and reliability of visual analogue scale. J Clin Physiotherapy Res.
9. Cheatham SW, Kolber MJ, Cain M, Lee M. Effects of manual therapy on pain and ROM. J Bodyw Mov Ther. 2015;19(1):109–121.
10. Clanton TO, Coupe KJ. Hamstring strains in athletes: diagnosis and treatment. J Am Acad Orthop Surg.
11. Gajdosik RL, Lusin G. Hamstring muscle tightness: reliability of the active knee extension test. Phys Ther.
12. Itotani K, Kawahata K, Takashima W, *et al.* Myofascial release improves physical performance. Healthcare. 2021;9(6):674.
13. Mishra D, Prakash RH, Mehta J, Dhaduk A. Comparative study of ART and MFR. J Clin Diagn Res. 2018;12(3):YC01–YC04.
14. Prior M, Guerin M, Grimmer K. An evidence-based approach to hamstring strain injury. Sports Health.
15. Wilke J, Krause F, Vogt L, Banzer W. Evidence-based aspects of myofascial chains. Arch Phys Med Rehabil. 2019;100(3):454–461.

How to cite this article: Seb N, Kumar S, Srivastava S. Effectiveness of active release technique compared with myofascial release for hamstring strains in football athletes: A randomized clinical trial. *International Journal of Agriculture and Food Science*. 2026;8(11):230-232. doi: https://www.doi.org/10.33545/2664844X.2026.v8.i11d.89923

2664844X, 2026, 8(11), Downloaded from https://www.doi.org/10.33545/2664844X.2026.v8.i11d.89923 by International Journal of Agriculture and Food Science on [05/11/2026]. See the Terms and Conditions (https://www.agriculturaljournals.com) for rules of use; OA articles are governed by the applicable Creative Commons License