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Effectiveness of Active Release Technique on Hamstring Tightness in College-Going Students

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Abstract: Background: Hamstring tightness is a frequent musculoskeletal condition among college students, attributed to prolonged sitting, poor posture, or athletic overuse. It can restrict range of motion (ROM) and increase susceptibility to injuries. The Active Release Technique (ART) is a manual therapy approach that helps in reducing soft tissue adhesions and restoring normal muscle function.

Objective: To assess the effectiveness of Active Release Technique in improving hamstring flexibility among college-going students.

Methodology: The experimental study included 30 college-going students aged 18–25 years diagnosed with hamstring tightness. Participants underwent ART intervention three times a week for four weeks. The outcome measures included the Ankle–Knee Extension Test, Sit and Reach Test, Popliteal Angle, and Straight Leg Raise Test, evaluated before and after the intervention. Data were analyzed using the paired t-test.

Results: Statistically significant improvements ($p < 0.05$) were observed in all outcome measures post-intervention. The mean increase in ROM ranged from 20–30%, indicating enhanced muscle extensibility and flexibility.

Conclusion: Active Release Technique is effective in reducing hamstring tightness and improving flexibility in college-going students. It is a safe and practical physiotherapy approach for managing soft tissue restrictions and enhancing functional mobility.

Keywords: Active Release Technique, Hamstring Tightness, Flexibility, Range of Motion, Physiotherapy, Experimental Study.

I. INTRODUCTION

Hamstring tightness is one of the most prevalent musculoskeletal conditions among young adults, especially college students, due to sedentary behavior, prolonged sitting, or sports-related overuse. Tight hamstrings reduce range of motion, alter posture, and can lead to secondary conditions like lower back pain.

The Active Release Technique (ART), developed by Dr. Michael Leahy, is a manual therapy procedure that combines precise tension with specific movements to release soft tissue adhesions. By applying controlled pressure and movement, ART aims to restore normal tissue texture, tension, and length.

This study was conducted to evaluate the effectiveness of ART in improving hamstring flexibility in college-going students.

II. METHODOLOGY

- 1) Study Design: Experimental pre-post study.
- 2) Sample Size: 30 college-going students aged 18–25 years.
- 3) Sampling Technique: Simple random sampling.

A. Inclusion Criteria

- Participants with clinically diagnosed hamstring tightness.
- No recent lower limb injury or surgery.
- Willingness to participate in the study.

B. Exclusion Criteria

- Participants with neurological or musculoskeletal disorders.
- History of lower-limb trauma or surgery within six months.

C. Intervention Procedure

Participants received ART intervention on both hamstrings, three sessions per week for four weeks. Each session included:

1. Participant positioned prone.
2. Therapist applied tension from the hamstring origin to insertion.
3. Participant performed active knee extension while tension was maintained.
4. Each pass lasted 15–20 seconds and was repeated for 3–4 passes per session.

D. Outcome Measures

- Ankle–Knee Extension Test
- Sit and Reach Test
- Popliteal Angle
- Straight Leg Raise Test

E. Statistical Analysis

Pre- and post-intervention data were analyzed using the paired t-test. A p-value < 0.05 was considered statistically significant.

III. RESULTS

The results revealed significant improvement in hamstring flexibility after the ART intervention. Mean range of motion increased between 20–30% across all tests. The paired t-test results confirmed statistical significance ($p < 0.05$) in all parameters, demonstrating the positive effect of ART in enhancing muscle flexibility.

Table 1: Summary of Outcome Improvements

Test	Pre-Intervention	Post-Intervention	p-value	Result
Sit and Reach Test	Reduced	Improved	<0.05	Significant
Straight Leg Raise	Limited	Increased	<0.05	Significant
Popliteal Angle	Restricted	Improved	<0.05	Significant
Ankle–Knee Extension	Tight	Increased	<0.05	Significant

IV. DISCUSSION

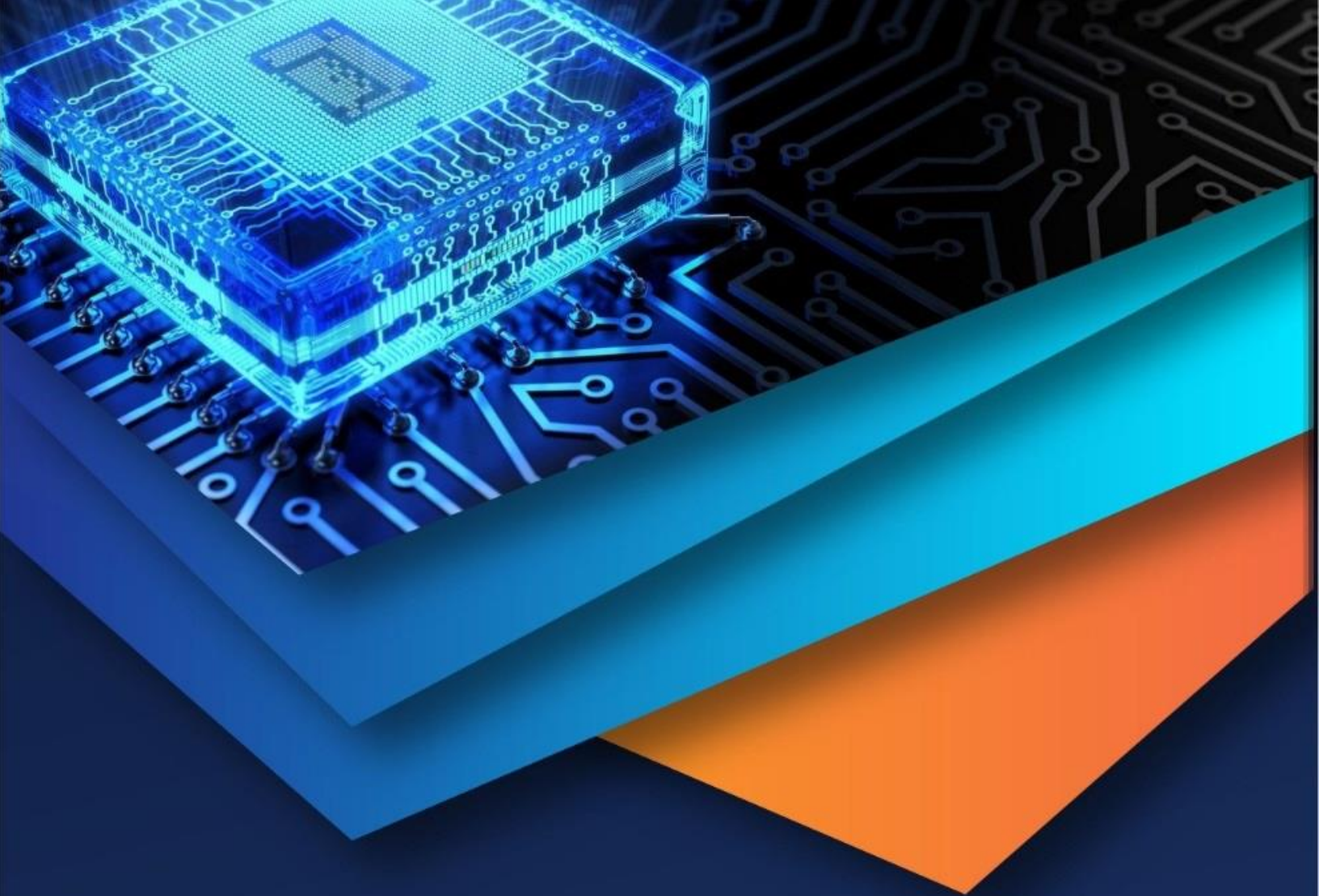
The findings of this study demonstrate that the Active Release Technique is effective in reducing hamstring tightness and improving flexibility. The improvement observed may be attributed to ART's ability to break down myofascial adhesions, improve circulation, and restore normal muscle movement patterns. Previous literature supports the positive outcomes of ART in enhancing muscle performance and reducing tissue stiffness. The results suggest that incorporating ART in physiotherapy practice can provide substantial benefits for flexibility enhancement and injury prevention. The single-group design, however, limits comparison with other interventions; future research could compare ART with stretching or myofascial release for a more comprehensive understanding.

V. CONCLUSION

The study concludes that Active Release Technique significantly improves hamstring flexibility in college-going students. It effectively reduces muscle tightness, enhances range of motion, and can be utilized as a practical tool in physiotherapy to promote better lower-limb function and prevent musculoskeletal injuries.

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