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# The Efficacy of Intrinsic Foot Muscle Training on Medial Longitudinal Arch Dynamics, Center of Pressure Sway, and Ankle Kinematics in Individuals with Excessive Pronation: A Systematic Review

Code:1689

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## Backgrounds

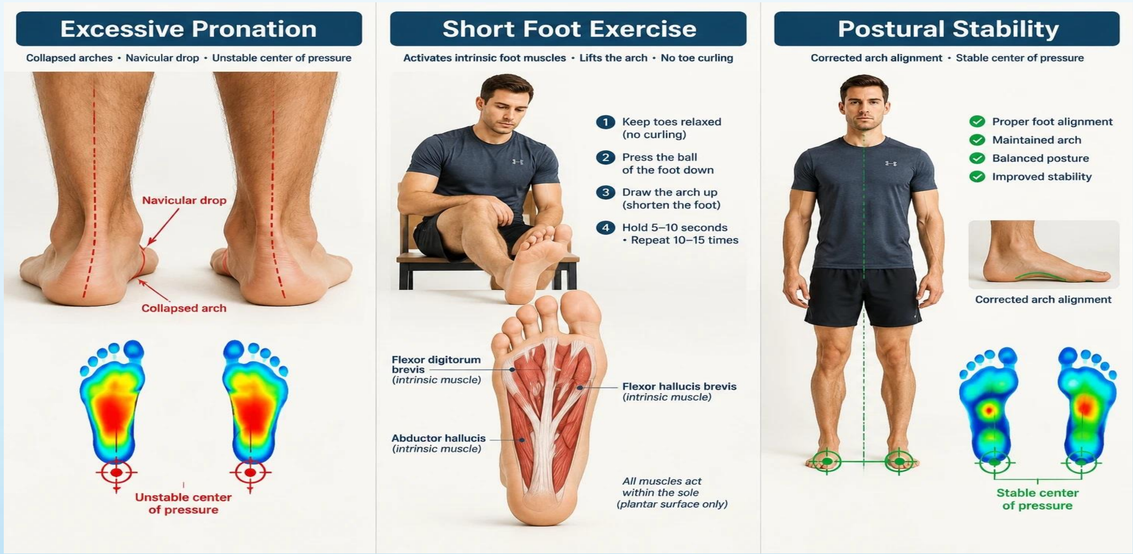
Excessive foot pronation is typically associated with the dynamic collapse of the medial longitudinal arch and adverse biomechanical alterations throughout the lower extremity. The objective of this systematic review was to evaluate the efficacy of intrinsic foot muscle training on arch dynamics, center of pressure (COP) sway, and ankle kinematics in individuals with excessive pronation.

## Methods

This systematic review was conducted in accordance with the PRISMA 2020 statement. A comprehensive literature search was performed across PubMed, Scopus, Web of Science, Embase, and CENTRAL databases up to February 2026. Inclusion criteria were restricted to interventional clinical trials that investigated the impact of intrinsic foot muscle training on biomechanical outcomes. Methodological quality was rigorously assessed using the Physiotherapy Evidence Database (PEDro) scale and the Cochrane Risk of Bias 2 (RoB 2) tool.

## Findings

Out of 485 identified records, four clinical trials (comprising three randomized controlled trials and one non-randomized trial, with a total of 144 participants) met the inclusion criteria. The mean PEDro score for the included studies was 6.8 out of 10. Qualitative synthesis indicated that 4 to 8 weeks of short foot exercise (SFE) significantly reduced navicular drop, improved the Foot Posture Index (FPI-6), and decreased COP sway area and velocity. However, evidence concerning 3D ankle kinematics, such as the calcaneal eversion angle, demonstrated lower certainty due to the limited number of studies employing 3D motion capture, as well as methodological heterogeneity and variable training protocols across the trials.




## Conclusion

Intrinsic foot muscle training, particularly short foot exercises, serves as an effective intervention for neuromuscular re-education, improving the structural stability of the medial longitudinal arch, and enhancing postural stability in individuals with excessive pronation. Therefore, their inclusion in rehabilitation and corrective exercise programs is recommended.

## References

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