

In-Field Gait-Training for Runners with Exercise-Related Lower Leg Pain



PRACTICAL SIGNIFICANCE

Outdoor sensor-based contact time gait-training with home exercises was more effective at alleviating pain and improving running biomechanics than home exercises alone for runners with exercise-related lower leg pain.

STUDY BACKGROUND

Exercise-related lower leg pain (ERLLP) remains among the most prevalent running-related injuries. While there is information on biomechanical contributors to injury progression in controlled laboratory environments, little is known about injured runners' biomechanics during outdoor running. Biomechanical features identified in ERLLP runners in natural settings may be used to drive objective gait-training interventions to advance clinical management. As such, we designed an outdoor-based gait-training intervention paired with home exercises to determine the effects on ERLLP patients' pain, function, and running biomechanics compared to home exercises alone.

OBJECTIVE

To assess the effects of a 4-week randomized controlled trial comparing an outdoor gait-training program to reduce contact time with home exercises (FBHE) to home exercises alone (HE) for runners with exercise-related lower leg pain (ERLLP).

DESIGN & STUDY

Field-based randomized controlled trial.

SUBJECTS

20 runners with ERLLP were

randomly allocated into FBHE or HE groups.

MEASUREMENTS

Both groups completed 8 sessions of home exercises over 4-weeks. The FBHE group received vibrotactile feedback through wearable sensors to reduce contact time during outdoor running. Patient-reported outcome measures (PROMs), gait assessments, and clinical measures were conducted for both groups. Repeated measures ANOVAs were used to assess the influence of group and timepoint on all outcomes.

RESULTS

The FBHE group reported increased function and recovery beyond the HE group at 6-weeks ($p < .001$). The FBHE group reported greater subjective improvement ($p = .004$) and reduced contact time ($p = .002$) at 4-weeks compared to the HE group and baseline. The FBHE group had increased cadence (MD: 7 steps/min, $p = .01$) at 4-weeks for indoor and outdoor running. Lower extremity strength measures were increased at 4-weeks for both groups ($p < .05$).

CONCLUSIONS

FBHE was more effective than HE alone for runners with ERLLP, manifested with improved PROMs, and gait biomechanics.

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