

Abstract

Background: Falls and fall-related injuries are the main reason for increasing health costs (Tsang and Hui-Chan, 2005). In this regard, only few studies have compared effects of different running surfaces on fall risk factors (Muehlbauer et al., 2015).

Objective: Therefore, this pilot study focused on the effects of trail versus road running on neuromuscular performance parameters. We hypothesize that trail running will lead to more pronounced adaptations.

Methods: 39 healthy middle-aged participants were randomly assigned to either the intervention (TRAIL; n=19) or control group (ROAD; n=20). 33 participants completed the 8-week training program. 10 subjects from each group were included for final analysis. Pre- and posttesting was performed for balance, gait, agility, strength, and endurance.

Results: The rANOVA analysis revealed no statistically significant time-group interactions. According to Cohen's d, large effects were calculated for the BESS test (d=1.2) and predicted $VO_{2\max}$ (d=0.95) for TRAIL and moderate effects for the BESS test (d=0.5), stride time single task (d=0.52), and $VO_{2\max\ pred}$ (d=0.53) for ROAD. The magnitude-based inference approach revealed a very likely effect for $VO_{2\max\ pred}$ (97%) and a likely positive effect (76%) for knee flexion total work, as well as possible effects for stride length dual task (72%), velocity single task (64%), the BESS test (60%), and the Y balance test left stance (51%) in favor of TRAIL.

Conclusion: The findings of this study present slightly more beneficial tendencies in favor of trail running but more research is needed in regards to its potential for preventing falls and fall-related injuries.

Keywords: postural balance; gait; agility; muscle strength; accidental falls; surface