

Habitual Users of Minimalist Footwear Display Better Dynamic Postural Stability During a Jump Landing Task

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Previous studies have shown that minimalist footwear (MF) is correlated to a reduction in loading forces and increased balance in subjects who previously were not exposed to MF. Limited research has been conducted to examine the long-term effects of MF on risk factors of ankle injury, such as worse dynamic postural stability. To help determine if MF use is beneficial, dynamic postural stability was observed in habitual users of MF compared to users of traditional athletic footwear. By utilizing the dynamic postural stability index (DPSI), lower scores in habitual users of MF can show potential for MF to lower the risk of injury. **PURPOSE:** To examine the effects of habitual MF use on dynamic postural stability. **METHODS:** Healthy, physically-active individuals ($n = 50$) who participate in regular high intensity interval training, participated in this study. The MF group (27.8 ± 5.5 yrs, 168.5 ± 11.0 cm, 73.1 ± 13.8 kg) consisted of 10 males and 15 females who regularly trained in MF. The non-minimalist (NM) group (22.9 ± 4.9 yrs, 170.0 ± 9.9 cm, 67.7 ± 12.1 kg) consisted of 11 males and 14 females who had no previous exposure to MF during training. Subjects jumped forward with both feet over a 30-centimeter hurdle and landed on their dominant foot on a force plate. Jump distance was set at 40% of their height with the hurdle placed at 20% height. A total of five trials were collected and averaged for the jumping task. The primary outcome variable (DPSI) and its component scores (APSI, MLSI, VSI) were calculated based on the ground reaction forces collected for the first three seconds following initial contact with a force plate recording at 1200 Hz. Higher DPSI measures indicate worse dynamic postural stability. Independent sample t-tests were used to compare average stability between the groups for hypothesis testing at $p < 0.05$. Mann-Whitney U was used for data that was not normally distributed. **RESULTS:** DPSI and VSI were significantly lower in the MF group ($p \leq 0.014$). The APSI and MLSI component scores were not significantly different between groups. **CONCLUSION:** The better dynamic postural stability in MF indicates a potential benefit to habitual use of MF as a training device. The lower DPSI might be attributed to an increase in proprioception, which is afforded by the footwear.

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