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ACCEPTED MANUSCRIPT

Foot strike pattern in children during shod-unshod running.

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Highlights

- Motor skills such as running and jumping are essential in most children's physical activities.
- In children, FSPs are influenced by shod/unshod conditions.
- RFS prevalence was similar between boys and girls
- Barefoot running alters FSPs from an RFS to a MFS and FFS.
- Barefoot running causes alterations in foot rotation and INV/EVE.

Abstract

The purpose of this study was to determine the foot strike patterns (FSPs) and neutral support (no INV/EVE and no foot rotation) in children, as well as to determine the influence of shod/unshod conditions and sex. A total of 713 children, aged 6 to 16 years, participated in this study (Age=10.28±2.71 years, body mass index [BMI] =19.70±3.91 kg/m^2, 302 girls and 411 boys). A sagittal and frontal-plane video (240 Hz) was recorded using a high-speed camcorder, to record the following variables: rearfoot strike (RFS), midfoot strike (MFS), forefoot strike (FFS), inversion/ eversion (INV/EVE) and foot rotation on initial contact. RFS prevalence was similar between boys and girls in both shod and unshod conditions. In the unshod condition there was a significant reduction ($p<0.001$) of RFS prevalence both in boys (shod condition=83.95% vs. 62.65% unshod condition) and in girls (shod condition=87.85% vs. 62.70% unshod condition). No significant differences were found in INV/EVE and foot rotation between sex groups. In the unshod condition there was a significant increase ($p<0.001$) of neutral support (no INV/EVE) both in boys (shod condition=12.55% vs. 22.22% unshod condition) and in girls (shod condition=17.9% vs. 28.15%

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