

## **BAREFOOT RUNNING CAUSES ACUTE CHANGES IN LOWER LIMB KINEMATICS IN HABITUALLY SHOD MALE RUNNERS**

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### **ABSTRACT**

*The purpose of this study was to compare differences in knee and ankle kinematic and spatio-temporal variables at foot strike between barefoot and shod running. Twelve male runners (age  $21.6 \pm 1.26$  years) performed six running trials in each running condition on a 12m indoor runway at a self-selected pace. Lower limb kinematics and spatio-temporal variables were recorded with a six-camera T10 Vicon motion capture system (200Hz). In the barefoot condition runners landed with significantly greater knee flexion ( $p < 0.01$ ;  $ES = 2.61$ ) and less ankle dorsi-flexion ( $p < 0.05$ ;  $ES = 1.12$ ) compared to in the shod condition. No significant differences were found between knee varus/adduction ( $ES = 0.78$ ) or ankle inversion/adduction ( $ES = 0.85$ ) between the barefoot and shod conditions. The barefoot condition had significantly shorter contact time ( $p < 0.01$ ;  $ES = 1.99$ ) and step time ( $p < 0.05$ ;  $ES = 1.13$ ), while significantly higher step frequency ( $p < 0.05$ ;  $ES = 1.25$ ) compared to in the shod condition. Results indicated that immediate adaptations occurred when transitioning from shod running to barefoot running.*

**Key words:** Barefoot running; Kinematics.