

# Changes in rearfoot strike patterns over childhood: A 3-year prospective longitudinal cohort study

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## **Abstract**

Rearfoot strike (RFS) in children running produces impact forces that give rise to a transient stress wave traveling through the body. It could contribute to the development of injuries. The purpose of this study was to determine RFS prevalence during childhood while running at a self-selected velocity in a prospective longitudinal cohort study. A total of 175 children (68 girls), aged 6 to 14 years, participated in this study. The sample was divided into three age groups (age in 2016): 6-8 years, 9-11 years, and 12-14 years which were analysed three years later (2019). 2D video-based was used to record the RFS Taking into account all samples, in the jogging trial the prevalence of RFS (an average of both feet) was 86.9% in 2016 and 94.7% three years later; in the running trial the prevalence was 82.6 and 94.4%, respectively. In all samples a significant increase of RFS prevalence was found in both the jogging and running trials for both feet over three years (jogging, left foot,  $p=.011$ , right foot,  $p=.023$ ; running, left foot,  $p=.001$ , right foot,  $p<.001$ ). In girls, there were no significant differences in any conditions. In boys, a significant increase of RFS prevalence was found after three years in both feet ( $p<.01$ ) in the running trial. This study shows that RFS prevalence in children increases with age and the results may be used to characterize typical running development in children population. © 2021, University of Zagreb - Faculty of Kinesiology. All rights reserved.

## **Author keywords**

Children; Foot strike patterns; Growth; Running