

24th Annual ECSS Congress Prague/Czech Republic, July 3-6 2019

The effect of shoe cushioning on injury risk in recreational runners: Does body mass matter?

Malisoux, L.

Luxembourg Institute of Health

INTRODUCTION:

Shoe cushioning technology of modern running shoes is expected to protect runners against repetitive loading of the musculoskeletal system, and therefore, running-related injuries (RRI). It is a common belief that heavier runners should use footwear with increased shock absorption properties to prevent RRI. Surprisingly, no study has provided evidence on the beneficial effect of increased shock absorption properties on injury risk so far. Therefore, the purpose of this study was to determine if shoe cushioning influences injury risk in recreational runners and whether the association depends on the runner's body mass.

METHODS:

This double-blinded randomized control trial included 848 recreational runners who randomly received one of two shoe models that only differed in their cushioning properties. Global stiffness was 61 ± 2 and 94 ± 6 N/mm in the Soft and Hard versions, respectively. Participants were classified as light or heavy according to their body mass using the median as cut-off (separately for men and women). Training and injury data were collected during 6 months on an internet based platform: www.tipps.lu. An RRI was defined as any running-related musculoskeletal pain in the lower limbs that causes a restriction or stoppage of running (distance, speed, duration, or training) for at least 7 days. Cox regression analyses were used to compare RRI risk between the two groups based on hazard rate ratios (HR) and their 95% confidence intervals (95%CI), controlling for potential confounders. A stratified analysis was conducted to separately investigate the effect of shoe cushioning on RRI risk in lighter and heavier runners.

RESULTS:

Median body mass was 78.2 and 62.8 kg in men and women, respectively. A total of 24954 running sessions were recorded, of which 97% were performed with the study shoes. 131 participants (15.4%) sustained at least one RRI during the intervention. The overall incidence was 5.6 RRI/1000h of running (95%CI=4.8; 6.7). Body mass was not associated with injury risk (HR=1.00; 95%CI=0.99-1.02). The adjusted Cox regression analysis revealed that the runners who had received the Soft shoes had a lower hazard rate for RRI (HR=0.67; 95%CI=0.47-0.94). Previous injury was identified as a risk factor (HR=1.78; 95%CI=1.19-2.65), while there was a trend for age (HR=0.98; 95%CI=0.86-1.00) to be a protective factor. When stratified according to body mass, results showed that lighter runners benefited from Soft shoes (HR=0.54; 95%CI=0.33-0.90) while heavier runners did not (HR=0.84; 95%CI=0.51-1.36).

CONCLUSION:

The overall injury risk was lower in runners who had received the shoe version with higher cushioning properties. While body mass was not associated with RRI risk, the stratified analysis revealed that only lighter runners actually benefit from higher cushioning, in contrast with popular belief.

Topic: Sports Medicine and Orthopedics

Presentation form: Oral

European Database of Sport Science (EDSS)

Supported by SporTools GmbH



12984