The Effects of Barefoot and Shod Running on Risk of Injury in High School, Female, Recreational Runners

Boyer, Megan

While previous studies have investigated the incidence of injuries among high school cross country runners, there has yet to be a study conducted to compare barefoot and shod running in this population. My experiment investigates the influence of these two conditions on biomechanical risk factors that have previously been associated with injuries in female high school runners. Eleven recreational runners participated in this study. Ten trials were conducted per condition for each runner. A trial was defined as one run down the fifty foot long track with the runners striking the force plate with their right foot. Step frequency, step length, contact time, knee flexion angle in the stance phase, sole angle at touchdown, the peak impact force, and the length of time the maximum force was sustained for were compared between both conditions. Stride length and contact time were both shorter in the barefoot condition, which led to less prominent rearfoot striking among the majority of runners. The knee flexion angle and sole angle were also smaller when barefoot, which are both impact reducing mechanisms. Impact forces were higher in the barefoot condition, as was expected for runners who typically run with shoes. However, other biomechanical adaptations were clearly made. This includes a shorter period of time during which the maximum force was sustained during barefoot running in comparison to shod running. This information could be used to support a prospective study that follows barefoot and shod high school runners to determine the incidence of injury in each group.

Awards Won:
Fourth Award of $500