

Institutionen för kost- och idrottsvetenskap

# Running-related injuries among recreational runners

How many, who, and why?

av

Jonatan Jungmalm

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Fakultetsopponent: *Associate Professor Marienke van Middelkoop, Erasmus  
University Medical Centre Rotterdam*



# Abstract

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Author: Jonatan Jungmalm  
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*Background.* It is important for improving and maintaining general health to engage in regular physical activity. A major barrier to retain in regular physical activity is quitting because of an injury. In running, one of the most practiced leisure-time physical activities on a global scale, injuries are unfortunately common. The purpose of this dissertation was to explore questions related to *how many, which types of and why do* recreational runners sustain injuries. Specifically, how many runners sustain an injury over one year, and which are the most common anatomical locations of running-related injuries? More, are injuries more frequent in runners who have certain characteristics compared to runners having different characteristics? Finally, can exploring changes in training load help understand why running-related injuries occur?

*Methods.* The dissertation builds on five papers, all based on data from a prospective cohort study named SPRING. Data were collected from 2016 to 2018. In addition, one paper (paper II) includes data from three other prospective cohort studies. One paper (paper I) is a study protocol presenting the design and methods. More than 200 injury-free male and female recreational runners between the ages of 18 to 55 years were recruited from the Gothenburg Half Marathon. The runners underwent a baseline examination consisting of tests for clinical/anthropometrical factors (such as range of motion, flexibility and trigger points), running style and isometric strength. Their training and injury status were then monitored for one year, or until the runners were injured or censored (leaving the study due to other reasons than injury). A sports medicine doctor diagnosed the runners with injuries. The 1-year follow-up included training data from more than 17 000 running sessions, from all participants.

*How many injuries occur?* We found a cumulative proportion of new running-related injuries among recreational runners to be 46% over one year. Across the four studies in paper II, the difference between cumulative incidence proportions calculated with and without censoring ranged between 4% and 22%. In the SPRING-study, the difference was 13%-points, increasing from 33% without censoring to 46% with censoring. The most common anatomical locations were the knee (accounted for 27% of all injuries) and the Achilles tendon/calf area (25% of all injuries).

*Who sustains an injury?* It was found that runners with a previous injury were almost twice as likely to sustain a running-related injury as runners with no previous injury (Hazard ratio= 1.9, 95% confidence interval (95%CI) = 1.2–3.2). Moreover, the results suggest no associations at all between excessive or restricted joint range of motion, excessive or restricted muscle flexibility or having painful trigger points, and running-related injury, meaning that none of these variables served as strong predictors for running-related injury. However, runners having late timing of maximal eversion or a low ratio between hip abductor strength and hip adductor strength (i.e. relatively weak hip abductors) sustained 17%-point (95%CI= 1–34) and 21%-point (95%CI= 1–40) more injuries, respectively, compared with runners in the corresponding reference groups.

*Why does injury occur?* The data presented in this dissertation could not reveal the answer to the question of why running-related injuries occur. Although no strong causal relationship between changes in training load and running-related injury was found, the attempt to move closer to causal conclusions is novel in the running-related injury literature. Future studies will need thousands of more runners, and injuries, to reveal potential causal relationships.