



### A scoping review of the occurrence and characteristics of firefighter exercise and training injuries

We wanted to know how and why firefighters are getting injured during exercise and training.



#### What is the problem?

Firefighters need to exercise and do training drills to keep up with their job demands. But firefighters are at risk of getting injured during exercise (e.g., strength and fitness-based activities) and training (e.g., structural firefighting, auto extrication). We wanted to get a better understanding of how and why injuries occur during these activities. Our goal was to summarize information about firefighter exercise and training injuries from current research.

#### How did the team study the problem?

We searched for published studies on firefighter exercise and training injuries in five online scientific databases and Google Scholar (up to November 2021). We summarized the information from firefighter exercise and training injury studies in Microsoft Excel.

#### What did the team find?

We found 23 relevant studies. The occurrence of exercise and training injuries ranged from 8% to 55%. Specifically, 7 studies reported that exercise injuries accounted for 2.5% to 39.6% of injuries, 1 study reported that sporting activities accounted for 41% of injuries, and 13 studies reported that training injuries accounted for 1.5% to 33.3% of injuries. Six studies provided specific training injury details with sprains, strains, and muscular pain (32% to 73%) and wounds, cuts, bleeding, bruising (16% to 20%) being the most common type of training injuries. The most common exercise and training injuries involved ankles (11.4% to 32%), knees (20.4% to 22%), legs (29%), back (18% to 27%), and shoulders (22.7% to 31.8%). Only two studies identified what action led to the exercise or training injury: running (16% to 22%), as well as bending, lifting, and twisting (9% to 14%). Some studies suggested that firefighters focus on proper exercise form, increasing flexibility and strength, and proper warm-ups before training.

#### How can this research be used?

This research can be used to create educational resources to help increase firefighters' awareness of injury risks so that they can do their exercise and training drills in a safer way. Our study findings can also guide the development of programs and policies to help prevent exercise and training injuries.

#### Cautions

The research indicates that exercise and training-related injury is a substantial problem for firefighters, but the studies do not provide causes or solutions. The studies included in our review did not describe the training or exercise activities being performed at the time of the injury. More detail about the exercise or training tasks is needed to help identify ways that firefighters can do these activities more safely and reduce their injury risks. The studies do not represent all firefighters: a small amount of data was found for female firefighters, and only 3 of the 23 studies reported including both career and volunteer firefighters.

**Reference:** Carr-Pries NC, Killip SC, MacDermid JC. Scoping review of the occurrence and characteristics of firefighter exercise and training injuries. *Int Arch Occup Environ Health*. 2022 Mar 9. doi: 10.1007/s00420-022-01847-7.

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