The bigger they are the harder they fall.

A review of *Obesity and incident injury among career firefighters in the Central United States* ***Original article written by:*** SA Jahnke et al. Obesity 2013 21:1505-08.

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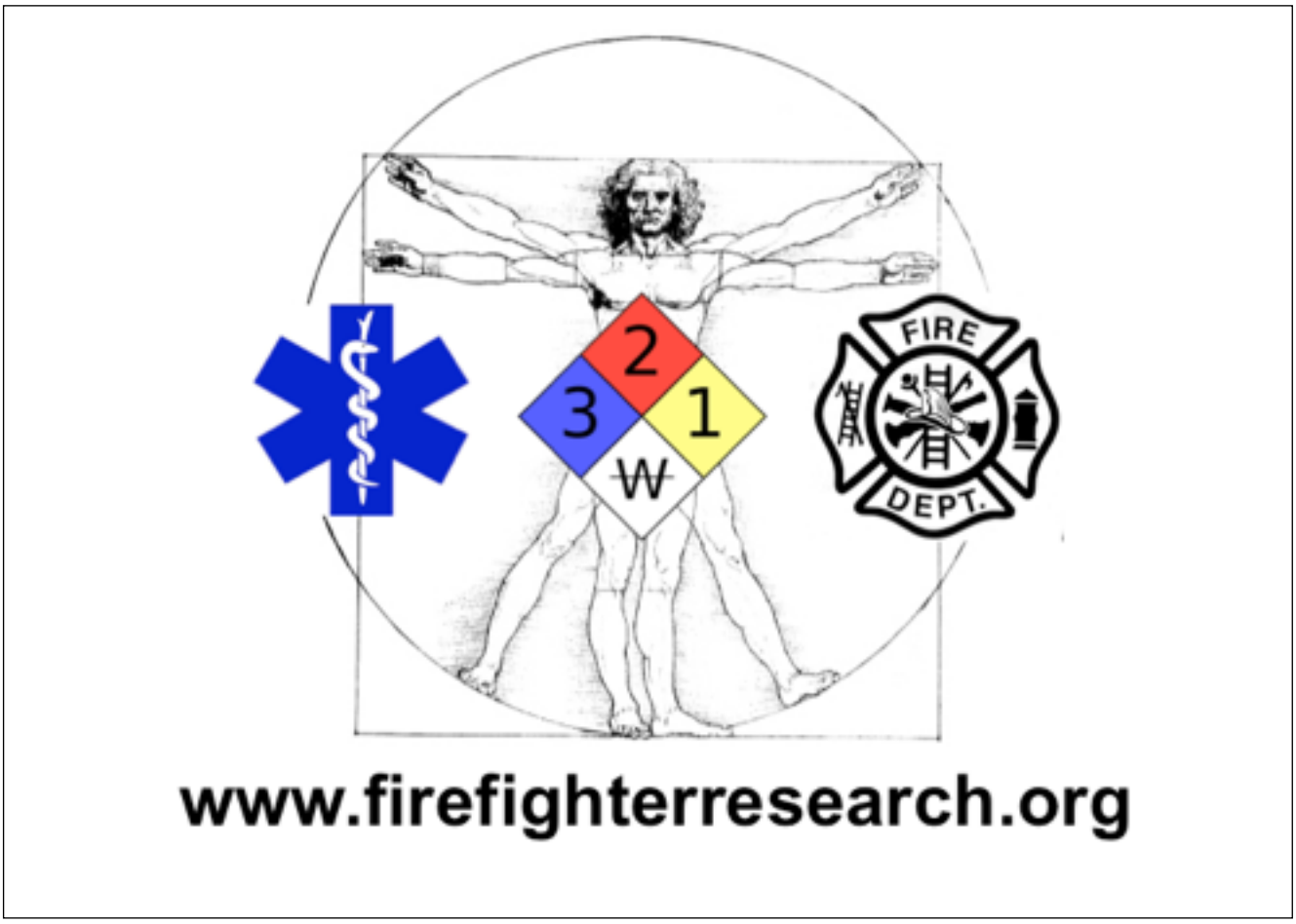

Introduction

Firefighters have a higher rate of injury compared to other professions. Firefighters also suffer higher rates of overweight and obesity when compared to the general population. However, a connection between excess body fat and injury has not been established for the fire service.

What the study did

Researchers from the Center for Fire Rescue and EMS Health Research collected data for this study from a cohort of career firefighters from 11 departments across the Central United States. At baseline, the firefighters were weighed and had measurements taken to calculate body mass index (BMI), waist circumference, and percent body fat. From these data the firefighters were categorized as normal weight, overweight, or obese. The firefighters were reassessed nine months later and asked if they had suffered a musculoskeletal injury in that period.

What the study reported

The average age for the firefighters in this study was 38 (SD 10) years and the group was 70% firefighters and 30% officers. Overall, 6% of the group who did not have a musculoskeletal injury at baseline had been injured during the follow up period. Obese firefighters, defined as those with a BMI > 30 kg/m^2, were 5.2 times more likely to suffer a musculoskeletal injury when compared to firefighters classified as normal weight. When measured by waist circumference, firefighters with a waist greater than 40 in. were 2.8 times more likely to suffer a musculoskeletal injury. Fitness and health behaviors including smoking, problem drinking, daytime sleepiness, and depression were not associated with increased risk of injury.

What it means for the fire service

There is a strong association between musculoskeletal injury and obesity as measured by BMI and waist circumference. This study is yet another indication that

the fire service must continue to evolve into an organization that values fitness and its positive effect on performance.

The reason for this association could be attributed to a number of things. One likely scenario is that heavier firefighters put higher than normal stress on their joints, especially the lower extremities increasing their risk of musculoskeletal injury. The strain on the bones, ligaments, and tendons further increases when adding turnout gear and SCBA. This theory would be consistent with other studies that have shown associations between obesity and ankle injuries in the general population. Heavier individuals who are active tend to have greater absolute strength in their legs because they have adapted to carrying their mass. This appears to be an advantage when performing heavy work. However, this "advantage" disappears when you divide an individual's maximum strength by their body weight. This expression of relative strength favors leaner firefighters and may provide additional insight to explain this study's findings.

It has been argued that BMI is flawed and penalizes large, muscular firefighters which could have influenced the findings. Hydrostatic weighing, air plethysmography, and DXA are the gold standards of body composition testing but these techniques are expensive, time consuming, and require that the firefighter report to a clinical or fitness testing facility. Field techniques such as BMI and waist circumference are validated against the gold standards and provide useful information when screening large numbers of individuals. It is true that large, lean individuals have a high BMI but this sort of mistaken classification (false positive) is rare and another study has shown that BMI is more likely to under classify a firefighters body composition rather than over classify.

In summary, 'big' and 'strong' are not always the same thing. Obese firefighters, even if skilled at fire suppression and rescue operations may be at greater risk for debilitating musculoskeletal injury.