

Effects of a 4-Week Fitness Intervention on Vascular Health and Fitness in Firefighters vs Non-Firefighters

Tia R. Wisdo, Allyson K. Getty, Lauren N. Chavis, Samantha Close, Cassandra Derella, William DiCurcio, Rejeanna Jasinski, Kelly McLaughlin, Avery Perez, Meaghan Corbin, Alyssa Polimeni, Jessica Hill, Deborah L. Fearheller. Ursinus College, Colledgeville, PA

Research shows that one of the independent risk factors for cardiovascular disease is increased sedentary time. Physical fitness is inversely related to mortality, and decreasing sedentary time and increasing exercise time can improve cardiovascular risk. Very few studies have previously found that 4-weeks of exercise can improve cardiovascular health and fitness levels. Firefighters are an ideal population considering most of them are sedentary. Approximately 70% of firefighters are volunteers, and health and fitness screenings are often not required. Also, over 50% of the firefighter line-of-duty deaths are cardiac related. **PURPOSE:** The purpose of this study is to compare the effects of a 4-week functional fitness exercise intervention on vascular and fitness levels between volunteer firefighters and non-firefighters. **METHODS:** We had 41 adults participate in the study; 27 volunteer firefighters and 14 non-firefighters. We measured blood pressure (systolic, SBP; diastolic, DBP), flow-mediated dilation (FMD), carotid artery intima media thickness (IMT), body mass index (BMI), fat mass (FM), total high-density lipoproteins (HDL), triglycerides (TRG), as well as fitness variables including VO_2 peak, 2-minute stair climb, right-and left-leg balance, plank, 12-step sprint, and wall sit. **RESULTS:** We found improvements in cardiovascular health and fitness after only 4-weeks of exercise. Firefighters showed improvements in SBP (pre-128.1 \pm 1.8 mmHg; post-121.7 \pm 1.9 mmHg), DBP (pre-77.8 \pm 1.1 mmHg; post-74.5 \pm 1.2 mmHg), BMI (pre-30.9 \pm 1.0; post-30.9 \pm 1.0), FM (pre-68.6 \pm 4.8; post-65.8 \pm 4.8), HDL (pre-39.0 \pm 2.3mg/dL; post-40.3 \pm 2.2 mg/dL), TRG (pre-118.2 \pm 11.8; post-97.3 \pm 11.1), and wall sit time (pre-102.0 \pm 12.9 sec; post-118.8 \pm 10.3 sec). We found no differences between groups with the intervention in vascular health variables. Firefighters also had more improvements than non-firefighters in most fitness measures. **CONCLUSION:** Preliminary data suggests that 4 weeks of exercise improves cardiovascular health and fitness measures. In addition, it was seen that although firefighters start out the intervention in worse vascular and fitness conditions, they actually improved more after the 4 weeks of exercise.