

Impact Of Cardiorespiratory Fitness On Markers Of Cardiovascular Disease Among Law Enforcement Officers

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Category: Masters

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ABSTRACT

Law enforcement officers (LEOs) have heightened cardiovascular disease (CVD) risk due to the stressful nature of their occupations. The prevalence of CVD among LEOs is 1.7 times higher compared to that of the general public. Higher cardiorespiratory fitness (CRF) levels (VO_{2max}) are associated with lower oxidative stress and inflammatory markers, as well as lower cardiovascular disease (CVD) risk; however, there is a lack of data examining this relationship among law enforcement officers (LEO). **PURPOSE:** To examine differences in markers of CVD risk between LEOs classified as having either high or low levels of CRF. **METHODS:** Seventy-three career male and female LEOs completed a maximal cardiopulmonary exercise test (CPXT), where VO_{2max} was estimated from the foster equation. Fasted blood samples were taken to assess traditional and non-traditional CVD risk biomarkers: high-density lipoprotein (HDL), low-density lipoprotein (LDL), glucose, total cholesterol, triglycerides, advanced oxidation protein products (AOPP), cortisol, and C-reactive protein (CRP). Body fat percentage (BF%) was determined via dual-energy X-ray absorptiometry (DEXA), VO_{2max} values were categorized based on American College of Sports Medicine (ACSM) guidelines to establish a high-fitness (HF) group (n=25) and a low fitness (LF) group (n=23). Shapiro-Wilk tests were used to assess normality. Independent sample T-tests or non-parametric Mann-Whitney U tests (if normality was violated) were used to assess differences in CVD risk biomarkers, fitness, and body composition between LEO categorized as HF and LF. Effect sizes were calculated as Cohen's d (i.e., small [0.2-0.5], medium [0.5-0.8], large [>0.8]). **RESULTS:** Participants classified as HF had significantly ($p<0.001$) higher VO_{2max} (HF: 38.5 ml/kg/min; LF: 32.4 ml/kg/min, $d=1.30$) and CPXT exercise times (HF: 11.05 min; LF: 9.54 min; $d=1.28$). In addition, the HF group had significantly ($p=0.029$) higher HDL concentrations (HF: 58.3 mg/dL; LF: 46.9 mg/dL; $d=0.65$). While not statistically significant ($p=0.052$), the LF group had greater fat mass compared to the HF group (HF: 48.3 lbs.; LF: 57.4 lbs.; $d=-0.576$). **CONCLUSION:** Given the cardioprotective benefits of higher HDL concentrations, these findings support the cardiometabolic benefits of having higher fitness levels among LEOs.