

## Handgrip Strength and VO<sub>2</sub>max Trends in Police Cadets: A Case Study

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### ABSTRACT

Among other components of physical fitness, performance on tactical tasks depends on cardiorespiratory endurance (CE) and muscular strength (MS). Police academies' curriculum aim to increase cadets' CE and MS, with males outscoring females in both tests. Curricula should assist cadets to adopt and adhere to a physically-active lifestyle while in the academy and upon graduation, for both health-related benefits and success in their tactical tasks. **PURPOSE:** To explore both CE-MS and sex trends between a four-year curriculum. **METHODS:** Retrospective data of 98 males and 79 females analyzed. Besides the senior year, cadets receive physical education classes. This serves as the foundation for adopting and adhering to physically-active lifestyle during their senior and postgraduation years by applying different training methods on their own. As part of their yearly evaluation, cadets completed a 12-min Cooper and a handgrip strength test. Estimated VO<sub>2</sub>max and absolute bilateral handgrip strength (HS) used as dependent variables. A multivariate analysis of variance (MANOVA) 4X2 for academic years and sex performed using SPSS<sup>®</sup>. **RESULTS:** Using Pillai's trace, there was a significant effect of academic years,  $V=.09$ ,  $F_{6,338}=2.6$ ,  $p=.02$ ,  $\eta^2=.04$  and sex,  $V=.80$ ,  $F_{2,168}=344.4$ ,  $p<.001$ ,  $\eta^2=.8$  on the HS and VO<sub>2</sub>max, but not for Years\*Sex,  $V=.02$ ,  $F_{6,338}=.66$ ,  $p=.69$ ,  $\eta^2=.01$ . Separate univariate ANOVAs on the outcome variables revealed non-significant academic years effect on HS,  $F_{3,169}=2.0$ ,  $p=.12$ ,  $\eta^2=.03$ , but significant effects on VO<sub>2</sub>max,  $F_{3,169}=3.9$ ,  $p=.01$ ,  $\eta^2=.07$ . Sex had a significant effect on both HS,  $F_{1,169}=479.8$ ,  $p<.001$ ,  $\eta^2=.77$  and VO<sub>2</sub>max,  $F_{1,169}=283.5$ ,  $p<.001$ ,  $\eta^2=.63$  respectively. **CONCLUSION:** In both tests, males outscored the females. Sophomores' VO<sub>2</sub>max was significantly lower than the other classmen. Sophomores' non-significant HS was the lowest, but juniors and seniors presented an increasing trend. CE and MS trends after a drop in sophomore year, presented an increasing trend. Larger-scale projects may need to further investigate behavioral interventions (e.g., goal setting, self-efficacy/monitoring) for promoting habitually-active lifestyle and increasing tactical performance. Limitations may include cross-sectional design, convenience sample, and unequal sample sizes.