



Mid Atlantic Regional Chapter of the American College of Sports Medicine

46th Annual Scientific Meeting, November 3rd - 4th, 2023
Conference Proceedings

International Journal of Exercise Science, Issue 9, Volume 12



Sex-differences and Changes in Psychophysiological Stress and Resilience During Military Training

Jennifer N. Forse, Kristen J. Koltun, Matthew B. Bird, Mita Lovalekar, Elizabeth Steele, Brian J. Martin, and Bradley C. Nindl, FACSM. University of Pittsburgh, Pittsburgh, PA

Individuals undergoing initial military training are exposed to multi-stressor environments to simulate wartime situations and ensure tactical readiness, which may impact physiological and psychological measures of stress, but the positive adaptation to stress (i.e., resilience) has not been extensively studied. **PURPOSE:** Compare baseline measures of physiological and psychological indicators of stress and resilience between those that dropout vs. complete Marine Corps Officer Candidates School (OCS) and examine changes in men and women who complete OCS. **METHODS:** A total of 163 candidates (age: 24.6 ± 3.5 years; BMI: 25.1 ± 2.3 kg/m²; 38% women) completed a post-awakening saliva collection, the Perceived Stress Scale (PSS), and the Connor-Davidson Resilience (CD-RISC) scale at the start and end of OCS. Successful completion of training was ascertained from staff records. Salivary cortisol (SC), testosterone (ST), and α -amylase (SA) concentrations were analyzed using enzyme-linked immunoassays. Baseline SC, ST, SA, PSS total score, and CD-RISC total score were compared between completers (C) vs. non-completers (NC) using independent samples *t* tests. Two-way mixed measures ANOVAs (time*sex) were performed for each dependent variable; $\alpha=0.05$.

RESULTS: Baseline SC, ST, and SA concentrations and CD-RISC were not different between C and NC ($p=0.064-0.443$). Baseline PSS was higher in those that dropped out from training (NC: 15.4 ± 6.4 ; C: 11.4 ± 5.8 , $p<0.001$). There were no significant interaction or main effects for SC or SA. There was no significant time*sex interaction for ST; however, a main effect of sex indicated that concentrations were greater in men than women (men: 137.5 ± 5.5 pg/mL, women: 61.3 ± 7.8 pg/mL, $p<.001$, $h^2=0.484$). A significant interaction effect on CD-RISC ($p=0.040$, $h^2=0.056$) was present. In men, CD-RISC total score did not change from pre- to post-testing (82.4 ± 10 to 82.5 ± 9.6 , $p=0.904$), while, in women, CD-RISC decreased (84.3 ± 6.8 to 80.9 ± 10.2 , $p=0.014$). There was no significant interaction or main effect of sex on PSS total score, but main effects of time indicated that PSS increased from pre- to post-testing (11 ± 0.9 to 16.5 ± 0.8 , $p<0.001$, $h^2=0.438$). **CONCLUSION:** Candidate's subjective feelings of stress, but not physiological indicators, increased following 10 weeks of initial military training. Sex-specific changes in resilience were present wherein men reported no change, while women's resilience was more responsive to training and decreased significantly. **SIGNIFANCE/NOVELTY:** Military training likely impacts subjective characteristics of stress while physiological measures of stress are more robust to changes. Resilience may be adaptable and future military training may be supplemented by adding mental resilience trainings to increase individual's ability to cope with stressors.

Supported by ONR Grant N00014-21-1-2725.