

# Autonomic and cortical response of soldiers in different combat scenarios

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## Abstract

**Introduction** The study of chronic and acute responses when exposed to extreme, aggressive and stressful environments, such as in combat environments, is becoming increasingly popular as such information leads to better optimisation of soldiers' physical and psychological performance, as well as mission effectiveness and efficiency. Due to internal complexity, uncertainty and variability of real combat scenarios, a specific approach to all possible types of military combat scenarios is necessary.

**Methods** Modifications in the autonomic modulation and cortical arousal before and after asymmetrical, symmetrical and close quarter combat simulations were analysed in 31 male professional veteran soldiers (age:  $34.5 \pm 4.2$  years) with between seven and 18 years of experience in their respective units, as well as experience in international missions in current conflict areas such as Lebanon, Afghanistan, Bosnia, Kosovo and Iraq.

**Results** The three combat situations produced a non-significant decrease in cortical arousal after combat simulations, presenting a trivial effect size in symmetrical and close quarter combat situations and a small effect size in asymmetrical situations. HR increased significantly in the three combat situations, and close quarter combat produced the highest sympathetic modulation of the three situations analysed. **Conclusion** Symmetrical, asymmetrical and close quarter combat situations produced an increase in sympathetic modulation, being highest in the close quarter combat situation, where actions are performed at a close distance and in closed spaces.

**Keywords:** Autonomic response, Cortical response, Combat scenarios