Block-Periodized Training Improves Physiological and Tactically-Relevant Performance in Naval Special Warfare Operators

**Context:** Naval Special Warfare (NSW) Operators are at risk for injury and may experience physical readiness decrement due to the operational demands and requirements of tactical training and deployment. Specific human performance training and prevention strategies are necessary to promote physical readiness and mitigate musculoskeletal injuries throughout the tactical life cycle. The Tactical Athlete Program (TAP) was refined based two years of laboratory and field testing to scientifically evaluate physical, physiological, and tactically-relevant characteristics in NSW Operators. **Objective:** To evaluate the effectiveness of a 12-week block-periodized training program to induce improvements in physical, physiological, and tactically-relevant performance in NSW Operators. **Design:** Controlled clinical trial. **Setting:** University-operated, Special Operations Forces human performance research laboratory. **Patients or Other Participants:** A total of 82 Operators participated (Experimental (N: 46)- Age: 29.4±5.5 years, Height: 176.7±6.4 cm, Mass: 86.7±11.6 kg; Control (N: 36)- Age: 29.0±6.0 years, Height: 177.1±6.3 cm, Mass: 85.7±12.5 kg). **Interventions:** Operators in the experimental group performed a 12-week block-periodized training program while Operators in the control group performed a 12 week daily undulating program. All training was performed concurrent with tactical training. **Main Outcome Measures:** Pre- and post-testing was performed to assess strength (isokinetic), flexibility, body composition, aerobic capacity/lactate threshold, and tactically-relevant performance (medicine ball throw, broad jump, 5-10-5 and 300-yard shuttle runs, weighted pull-up, body weight bench press, 1RM deadlift). Two way repeated measures ANOVA tests were used to analyze the dependent variables (p<0.05). **Results:** The experimental group demonstrated a significant loss in body fat (Pre: 16.6±7.1%, Post: 15.2±6.7%) and fat mass (Pre: 15.0±8.1 kg, Post: 13.7±7.6 kg) and increase in fat free mass (Pre: 73.0±9.1 kg, Post: 73.6±9.2 kg) while no changes were demonstrated in the control group (p=0.016-0.024). Within group improvements in VO2 peak were demonstrated for the experimental (Pre: 50.0±6.6 ml/kg/min, Post: 52.0±6.7 ml/kg/min, p=0.008) and control (Pre: 50.9±7.3 ml/kg/min, Post: 54.0±6.9 ml/kg/min, p=0.003) groups. The experimental group demonstrated a significant improvement in the pro agility test to the right (Pre: 5.1±0.37 s, Post: 4.97±0.36 s) and left (Pre: 5.09±0.4 s, Post: 4.93±0.32 s) directions and loaded pull up task (Pre: 13.4±5.1 reps, Post: 17.5±4.9 reps) while no changes were demonstrated in the control group (p=0.01-0.019). Within group improvements for the experimental group were demonstrated for the medicine ball toss (Pre: 390.0±40.0 cm, Post: 400.0±40.0 cm, p=0.005), broad jump (2.4±0.23 m, 2.52±0.38 m, p<0.001), and deadlift (171.2±25.5 kg, 179.8±22.4 kg, p=0.036). **Conclusions:** These data suggest implementation of a population-specific TAP based on scientific evaluation using a 12-week block-periodized design or daily undulating program design are both effective at inducing adaptations in physical readiness when performed concurrently with tactical training. However greater improvements were observed using block periodization. Further refinement is required to address improvements in injury mitigating characteristics. **Word Count:** 450