

7. SWACSM Abstract

Moderate Intensity Arm Cycling as a Viable Exercise Alternative for Overfat and Obese Individuals with Poor Cardiorespiratory Fitness

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ABSTRACT

The prescription of aerobic exercise engaging the arms may extend the reach of physical activity and improve cardiorespiratory fitness in individuals with obesity. **PURPOSE:** This study compared the acute cardiopulmonary responses obtained during isocaloric arm and leg cycling trials performed at different intensities among individual's with and without excess body fat. **METHODS:** Participants were 37 young adults divided into two groups based on their fat mass index, lean and average (LA) and overfat and obese (OFO). They were tested for mode-specific work rate at the ventilatory threshold (VT) and volitional fatigue (VF) during two randomized ramp tests. The main experiments consisted of four randomized constant work rate isocaloric trials for arm and leg cycling performed at moderate (i.e., work rate equivalent to 80% of VT obtained during the ramp tests) and heavy (i.e., work rate equivalent to 30% of the difference between VT and VF obtained during the ramp tests). The time to expend 100 kcal ($T_{kcal_{100}}$) was recorded, and oxygen uptake ($\dot{V}O_2$) was averaged for the duration of the tests. A two-way mixed factorial ANCOVA with physical activity level as a covariate determined work rate at VT, and $\dot{V}O_2$ peak responses to the ramp tests. A three-way mixed factorial ANCOVA with the mode-specific fitness difference and physical activity level as covariates were run for $T_{kcal_{100}}$ and $\dot{V}O_2$ obtained during isocaloric trials. Effect sizes (Cohen's d) were calculated and interpreted with magnitude thresholds and significance level was set at $p \leq 0.05$. **RESULTS:** Significantly lower work rates at VT and $\dot{V}O_2$ peak were shown for the OFO during ramp tests. $T_{kcal_{100}}$ was significantly longer for OFO in comparison to LA during isocaloric trials ($d=0.36$). The $\dot{V}O_2$ responses relative to body mass were significantly greater in leg cycling than arm cycling, while effect sizes were larger during heavy exercise ($d=1.45$) compared to moderate ($d=1.13$). **CONCLUSION:** Arm cycling performed at moderate intensity could be an alternative for young adults with excess body fat and poor cardiorespiratory fitness since this exercise modality elicited a sufficient metabolic response above three metabolic equivalents, which is within the moderate intensity domain suggested by current guidelines.