

A COMPARISON OF EXERCISE AND POST-EXERCISE ENERGY EXPENDITURE FROM TWO RESISTANCE EXERCISE BOUTS OF EQUAL WORK VOLUME, IN AFRICAN AMERICAN OVERWEIGHT FEMALES

Kathy Thornton, PhD, RN
Georgia Southern University
Statesboro, Georgia

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Purpose: Although there is little research concerning energy expenditure (EE) during and after resistance exercise, there is evidence that exercise intensity affects metabolic responses to resistive exercise. African American females have a high incidence of overweight but no study has been conducted on this population to investigate the impact of resistance exercise on EE. The purpose of this study was to determine the effect of resistance exercise intensity upon the magnitude of excess post-exercise oxygen consumption (EPOC) in African American overweight females. **Method:** Ten healthy overweight (BMI 25-30) untrained African American females completed three experimental exercise sessions. These included a control (baseline) session of quiet sitting, and two resistance exercise sessions of equal work output (load x repetitions x sets), in which participants completed three sets of nine exercises, one at high intensity (8 repetitions at 85% 8-repetition maximum (RM)) and one at low intensity (12 repetitions at 45% 8-RM). Using a portable metabolic system, oxygen consumption (VO_2), ventilation volume (V_E), respiratory exchange ratio (RER) and heart rate (HR) were measured continuously for 94 minutes and capillary lactate ($[\text{La}^-]$) was measured at four points during each session. Rating of perceived exertion was determined for each exercise session. Analysis included ANOVA with post hoc tests and paired t-test.

Results: Although the high intensity exercise produced a greater response for all variables, the mean minute values were not significantly different from the low intensity exercise. There were significant differences between the control session and the exercise sessions during the exercise period for mean minute values for all variables except RER. The only significant post-exercise mean minute value was between high intensity HR and control HR. For *single* minute values, however, differences were revealed between exercise and control sessions for VO_2 and V_E and HR for minutes 63-70. The mean $[\text{La}^-]$ at 0 and 15 minutes post-exercise was significantly different between control and exercise levels. The net VO_2 was significantly different between control and exercise levels during exercise. The total EE for the high and low intensity sessions respectively was 125 kcal plus 7 kcal EPOC and 117 kcal plus 5 kcal EPOC.

Discussion: The difference in exercise VO_2 for intensity level was minimal, as expected, due to the similar work output. The post-exercise VO_2 was not substantively different for intensity and the EE yield was small. In a previous study of white normal weight trained females performing similar exercise regimens, there was a significant difference for intensity level. The lack of differences in the current study may have been due in part to untrained participants not reaching their weight load maximum used to calculate intensity level or that African American females may have a greater proportion of fast twitch muscle mass that allows more efficient work. The data indicate that higher intensity resistance exercise regimens used in this study do not produce a greater EPOC and so either regimen would be equally appropriate for overweight black untrained females as part of a well rounded exercise training program to enhance EE.

No significant difference in:

0-30 EPOC (mean 1.26 LO2 HI; .87 LO2 LO)

mean net (total L O2) or mean minute (ml/min) VO₂

sig difference from control during exercise for both hi and low, but not between hi and lo for all variables except VO₂ (minutes 28-30 and 67)

Compared to a previous study of white normal weight trained participants, black overweight untrained females do produce a significantly different exercise response for post-exercise regimen EPOC for different exercise intensities. It is likely that untrained overweight individuals do not exert to reach maximums when tested and so may not be working at the specified levels.

Variable	Mean	SD
age	22.8	2.9
height	64.3	2160.75 cm
weight	72.4	10.37159.28 lbs
BMI	28.8	3.2
Body Fat %	33.8	4.45
VO2 Peak	25.6	6.37

Purpose: There is a paucity of research concerning energy expenditure during and after resistance exercise and there is evidence that exercise intensity affects metabolic responses to resistive exercise. Black females have a high incidence of overweight and its related impaired health but no study has been conducted on this population to investigate the impact of energy expenditure and resistance exercise. The purpose of this study was to determine the effect of resistance exercise intensity upon the magnitude of exercise excess post-exercise consumption (EPOC) in black overweight females.

Method: