**EXERCISE INTENSITY AND ENERGY EXPENDITURE ASSESSMENT OF PERFORMING THE CURVES WITH ZUMBA WORKOUT**

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**Abstract**

The Curves™ circuit-training program has become a popular form of exercise among sedentary women. The traditional program involves performing 30-sec of bi-directional hydraulic-based resistance-exercise interspersed with 30-sec of low-impact calisthenics to promote recovery for 30-min. We previously reported that this type of exercise program elicited an average exercise intensity of 126±15 b/min which was equivalent to 69% max heart rate, 64% of heart rate reserve (HRR), and 65±10% of VO2 max in post-menopausal women (FASEB J. LB93-94, 2006); that resistance exercise force production ranged between 45% - 79% of 1RM (FASEB J. LB93, 2006); and, women who completed two rotations through the circuit at 70-80% of 1RM using the computerized version of this equipment expended an average of 314±102 kcals (JSCR. 22(6):A69-70, 2008). A new version of this program has recently been introduced to add variety to the program which involves performing one-rotation of 1-min resistance exercise bouts at 50% of 1RM followed by 1-min of Zumba™ dance exercise. PURPOSE: To compare the exercise intensities of performing the standard (S) and newer version (N) of this program in sedentary women initiating and phase of exercise and weight loss program. METHODS: 19 women (39.5±11 yrs; 86±14 kgs; 45.4±4 % fat; 22.3±4 ml/kg/min peak VO2; 6.4±1.2 max METS) were familiarized with the S and N versions of the exercise program and participated in a minimum of six training sessions. HR was obtained using a Polar HR monitor while energy expenditure was measured using the CurvesSmart™ exercise equipment. Average HR was obtained during the resistance-exercise and calisthenics portions of the exercise bouts on all subjects. A subset of 8 to 10 subjects were also compared using dependent t-tests on each mode and phase of exercise.

**Rationale**

The Curves™ circuit-training program has become a popular form of exercise among sedentary women. The traditional program involves performing 30-sec of bi-directional hydraulic-based resistance-exercise on 8 to 13 machines interspersed with 30-sec of low-impact calisthenics to promote recovery for 30-min. We previously reported that this type of exercise program elicited an average exercise intensity of 126±15 b/min, which was equivalent to 80% max heart rate, 64% of heart rate reserve (HRR), and 65±10% of VO2 max in post-menopausal women (FASEB J. LB93-94, 2006); that resistance exercise force production ranged between 45% - 79% of 1RM (FASEB J. LB93, 2006); and, women who completed two rotations through the circuit at 70-80% of 1RM using the computerized version of this equipment expended an average of 314±102 kcals (JSCR. 22(6):A69-70, 2008). A new version of this program has been introduced which involves performing one-rotation of 1-min resistance exercise bouts at 50% of 1RM followed by 1-min of Zumba™ dance exercise. The purpose of this study was to compare the exercise intensities of performing the standard (S) and newer version (N) of this program in sedentary women initiating and exercise and weight loss program.

**Subjects**

- 19 women (39.5±11 yrs; 86±14 kgs; 45.4±4 % fat; 22.3±4 ml/kg/min peak VO2; 6.4±1.2 max METS) were familiarized with the S and N versions of the exercise program and participated in a minimum of six training sessions. The average HR for the N version workout was 141±10 bpm (77±5% PMHR) and the participants expended 307±47 kcals. The average HR for the S version was 146±15 bpm (81±7% PMHR) and they expended 326±98 kcals.

**Experimental Design**

**Methods & Procedures**

- 19 women (39.5±11 yrs; 86±14 kgs; 45.4±4 % fat; 22.3±4 ml/kg/min peak VO2; 6.4±1.2 max METS) were familiarized with the S and N versions of the exercise program and participated in a minimum of six training sessions. HR was obtained using a Polar HR monitor while energy expenditure was measured using the CurvesSmart™ exercise equipment. Average HR was obtained during the resistance-exercise and calisthenics portions of the exercise bouts on all subjects.

**Statistical Analysis**

- Data were analyzed by dependent t-tests.

**Results**

- Overall, the average HR for the N version workout was 141±10 bpm (77±5% PMHR) and the participants expended 307±47 kcals.
- The average HR for the S version was 146±15 bpm (81±7% PMHR) and they expended 326±98 kcals.
- Statistical analysis of the subset of subjects performing both types of training found an average HR of 143±14 bpm in the S group and 143±11 bpm in the N group (p=0.03) which represented 181.6±7% of PMHR in the S group and 78.1±4% of PMHR in the N group (p=0.08).
- No differences were seen in energy expenditure between groups (S 333±63; N 307±47 kcals; p=0.30).
- When exercise intensities were evaluated on each phase of the training program, participants elicited an average heart rate of 149±15 bpm in the S group and 143±13 bpm in the N group (p=0.10) on the resistance exercises (S 81.2±6; N 78.1±4 % PMHR, p=0.053). Conclusions: Results indicate that both of these types of training methods can increase heart rate to within recommended intensities. The N program elicits slightly lower exercise intensity than the S program.