

Comparing Physiological Responses While Walking on a Standard Motorized Treadmill and Curve Treadmill

Phipps, J., Miller, S., Voran S., Lister, M., Kieffer, H.S. Messiah College, Grantham, PA

jp1314@messiah.edu, sm1372@messiah.edu, sv1201@messiah.edu, ml1277@messiah.edu,
kieffer@messiah.edu

PURPOSE: The purpose of this study was to compare the physiological responses between exercise on a motorized treadmill (TM) and the Curve treadmill at similar Rating of Perceived Exertion (RPE).

METHODS: Twenty-one (10 males and 11 females, age = 20.8 ± 0.87 and 19.8 ± 1.03 years, respectively) recreationally active subjects participated in a randomized and counterbalanced comparative study.

Following a familiarization protocol, the subjects underwent one session on either the TM or Curve that consisted of a 1-2-minute warm-up followed by a 15 minute exercise session at a self-selected pace that corresponded to a 13 on the 6-20 Borg Scale. VO_2 , VE, and RER were collected via breath-by-breath analysis while heart rate (HR) and RPE were collected at intervals during the exercise session. The same protocol was repeated on the second modality after a minimum of 24 hours. A two-way ANOVA was performed on each variable, and a paired t-test was conducted, comparing total calories burned for each modality.

RESULTS: The main effect of condition was significantly higher for HR and VO_2 on Curve. The main effect of time was not significant for any variable. There were no interaction effects. Caloric expenditure was significantly higher for Curve for total work performed during the exercise session.

	Heart Rate (bpm)	VO_2 (ml/kg/min)	RER	Caloric Expenditure (kCal)
Motorized (TM)	114.2 ± 17.4	18.1 ± 11.3	0.93 ± 0.08	87.4 ± 26.4
Curve	$150.8 \pm 18.0^*$	$27.4 \pm 5.1^*$	0.94 ± 0.07	$143.0 \pm 33.3^*$

* $p > 0.001$

CONCLUSION: While working at a similar perceived exertion, the subjects elicited a higher HR and VO_2 on the curve compared to the standard treadmill. In addition, exercise on the Curve treadmill produced a 61.1% increase in caloric expenditure.