

OXYGEN UPTAKE DURING WHOLE BODY VIBRATION IN OVERWEIGHT WOMEN



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INTRODUCTION

- Acceleration training or whole body vibration training has been described as an effective method for strength training.
- To the best of our knowledge there are no studies on oxygen ventilation and energy expenditure during whole body vibration in overweight women.

AIM OF THE STUDY

To assess the effect of additional whole body vibration on the ventilation of oxygen which can be regarded as a measure for energy expenditure

METHODS

- A controlled randomized trial.
- Anthropometric measurements were taken in twenty adult overweight premenopausal women.
- Ventilation of oxygen (VO₂) and carbodioxide (VCO₂) and heart rate were measured using a portable gas-analysis system (Cortex Metamax 3B) and a Polar heart rate monitor.
- After each exercise a Borg scale score was assessed.
- Exercises were performed on a vibration platform (Power-plate, Next Generation) with a frequency of 35 Hz and the intensity set on 'high' (amplitude of 4 mm).
- Two dynamic exercises (standing on toes and squatting) and 1 static exercise (standing) were performed during 3 minutes with and without vibration in a randomized order with 10 minutes rest between exercises. Mean values of the third minute of exercise were compared.



N = 20	Mean	± S.D.
Height (m)	1.69	± 0.06
Weight (kg)	87.2	± 13.6
BMI (kg/m ²)	30.3	± 4.0
Age (y)	38.0	± 7.6
Bodyfat%	35.12	± 3.93
Resting heart rate	78.5	± 10.0
Resting VO ₂ (l/min)	0.283	± 0.071

Table 1: descriptive statistics participants



RESULTS

Ventilation of oxygen, carbon dioxide and heart rate were consistently significantly higher in the exercises with vibration compared to the exercises without vibration.

	Standing			Standing on toes (dynamic)			Squatting (dynamic)		
	No Vibration	Vibration	P	No Vibration	Vibration	P	No Vibration	Vibration	P
VO ₂ (l/min)	0.40	0.60	<0.001	0.58	0.71	<0.001	0.77	0.93	<0.001
VO ₂ (ml/min/kg)	4.6	7.0	<0.001	6.7	8.5	<0.001	8.9	10.9	<0.001
VCO ₂ (l/min)	0.27	0.41	<0.001	0.39	0.49	<0.001	0.51	0.64	<0.001
Heart rate (beats/min)	89.6	95.0	0.012	95.6	102.8	<0.001	103.2	110.6	0.002
Borg scale scores (6-20)	9.1	10.0	0.178	11.3	12.3	0.019	10.9	11.7	0.208

CONCLUSIONS

- The addition of whole body vibration to both static and dynamic exercises seems to increase the oxygen ventilation significantly in overweight women.
- More research is needed to find out what is causing this increase and whether this increase is clinically relevant.

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