Power-Plate proves effective for the elderly

Whole-Body-Vibration Training Increases Knee-Extension Strength and Speed of Movement in Older Woman.

Machteld Roelants, Sabine Verschueren & Christophe Delecluse
Katholieke Universiteit Leuven, Belgium

Published in the International Scientific Journal: **Journal of the American Geriatrics Society** (June 2004)

Results:

1. **The first long-term study on the effects of Power-Plate training in older women clearly demonstrates that strength and speed of movement increases after 24 weeks of training on the Power-Plate.**
2. **Power-Plate training proves to be a safe, suitable, and efficient strength-training method for the aging population. The findings of this study show that Power-Plate training has great potential for application in geriatric and therapeutic settings as a safe, low-impact strength training method. The low exertion and safety of loading el-derly subjects may indicate Power-Plate for weakened populations, for those who are not attracted to or able to perform conventional resistance training.**

The hypothesis of this study was the great potential of Power-Plate in a therapeutic context, where it may enhance muscular performance in patients and older adults who are not attracted to or are not able to perform standard exercise programs. Maintaining muscle mass, functional strength and cardiovascular performance is a challenge for the elderly due to risk of potential overload and the diminished ability of the aging body to adapt to high levels of loading. Power-Plate provides a safe and easy opportunity to train these systems without excessive overload.

Muscle strength and peak muscle power have a great influence on the function of older adults in activities of daily living such as walking, climbing stairs, and rising from a chair. Common risk factors leading to falls and hip fractures in older adults are muscle weakness and the inability of lower extremity muscles to produce rapid force. Older adults lose muscle mass with an age-related decrease in physical activity. Therefore, the prevention of age-related strength loss and muscle atrophy is a public health issue.

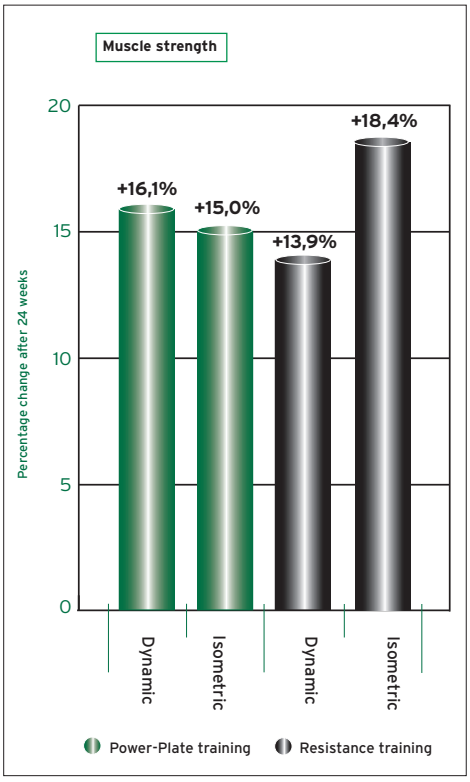
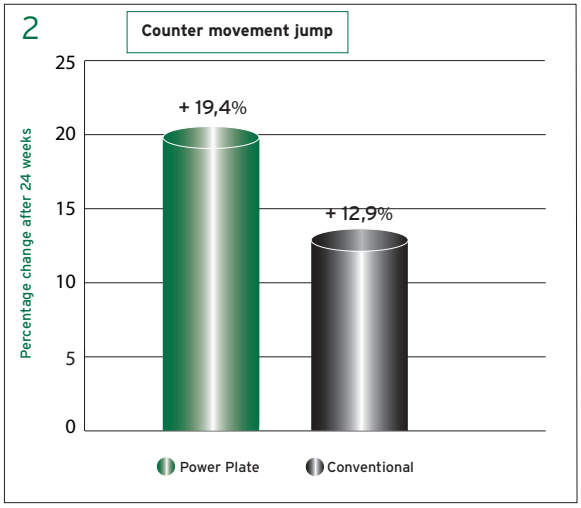


Fig. 1.
Percentage change in muscle strength of the legs after 24 weeks for the Power-Plate training group and conventional resistance training group.



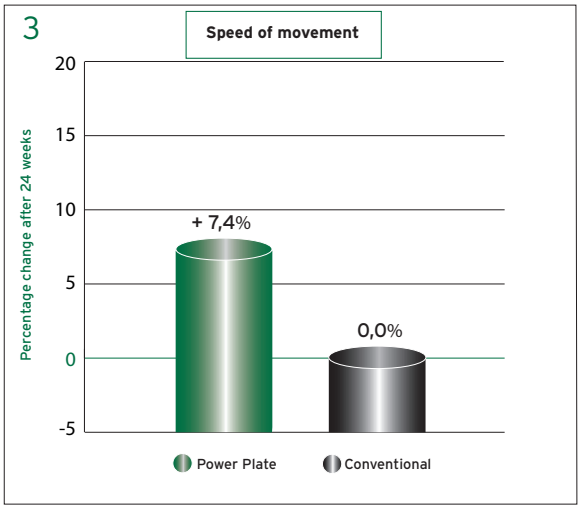


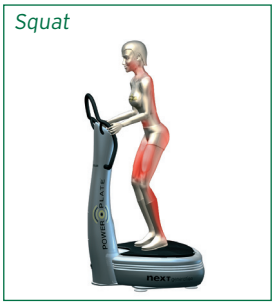
Fig. 2 + 3.
Change in performing the counter movement jump (fig. 2). The speed of movement increased only for the group that trained on the Power-Plate (fig. 3).

The research included 89 postmenopausal women between the ages of 58 -74 years old. Participants were randomly assigned to three groups: the Power-Plate group trained three times per week for 24 weeks; they performed a progressive program of static and dynamic knee extensor exercises such as squats and lunges. The conventional training group trained three times per week for 24 weeks; they performed dynamic leg press and leg extension exercises on conventional fitness equipment, increasing from low to high resistance.
The control group did not participate in any training.

The results prove that both Power-Plate and conventional training increases muscle strength of the legs (fig. 1). Both groups also showed an improvement in performing the counter movement jump (fig. 2). The speed of movement increased only for the group that trained on the Power-Plate (fig. 3).

The counter movement jump is an accurate method for measuring (the stretch shortening) of the muscles, a system used in daily life such as rising from a chair, climbing stair or maintaining balance. Speed of movement is a very important measure of reaction and balance, and reduces the risk of falling .

Power-Plate exercises performed:



Exercise Variables
Training volume and training intensity of the Power-Plate training program:

	start	week 12	end
Duration (minutes)	3	20	30
Number of different exercises	2	6	9
Longest duration of vibration without rest (sec)	30	60	60
Rest between exercises	60	5	5
Amplitude (low/high)	low	high	high
Frequency (Hz)	35	40	40

Power-Plate training minimizes the need for conscious exertion and stress on the musculoskeletal, respiratory, and cardiovascular systems. Most subjects enjoyed the Power-Plate sessions, and did not consider it to be a difficult workout, and reported a moderate degree of muscle fatigue at the end of the session.