

The Effects of Power Plate® Training on Fall Prevention in the Elderly

Power Plate Training Results in Reduced Fall Frequency and Improvement of the Response to Surface Rotations.

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By An Bogaerts, Sabine Verschueren, Christophe Delecluse, Albrecht L. Claessens, Steven Boonen
Katholieke Universiteit Leuven, Belgium.

Study Conclusions:

The present study, performed on a Power Plate Next Generation (2004), shows that one year Power Plate training in elderly persons resulted in reduced fall frequency and improvement of the response to surface rotations.

The aim of the study was to assess the effect of Power Plate training on postural control and the prevention of falls in the elderly.

The Power Plate generates vibrations that activate sensory receptors in the body, in turn provoking reflexive muscle contractions in leg and trunk muscles (tonic vibration reflex). As both sensory and motor pathways are strongly stimulated during Power Plate training, it is hypothesised that 12 months of training might result in improved postural control.

Method:

A total of 220 healthy older individuals between 60 and 80 years of age participated in this study. The Power Plate group performed static and dynamic exercises (see fig 1) on the Power Plate for a period of 47 weeks, three times a week. Training load increased gradually according to the overload principle. The duration of one Power Plate training sessions was maximum 40 minutes, including warming up and cooling down. The fitness group program consisted of cardiovascular, resistance, balance and flexibility exercises and lasted for approximately 1.5 hours.

The control group did not participate in any training during this period and were requested not to change their lifestyle. Postural control was evaluated before, after six, and after 12 months, using different test with moving platforms, disturbed vision and a moving visual surrounding.

Figure 1

Exercises from the Power Plate training program. Initially, balance was trained indirectly by exercising on one leg, after three months by exercising as often as possible without using the handrail, and after six months additionally the eyes were closed.



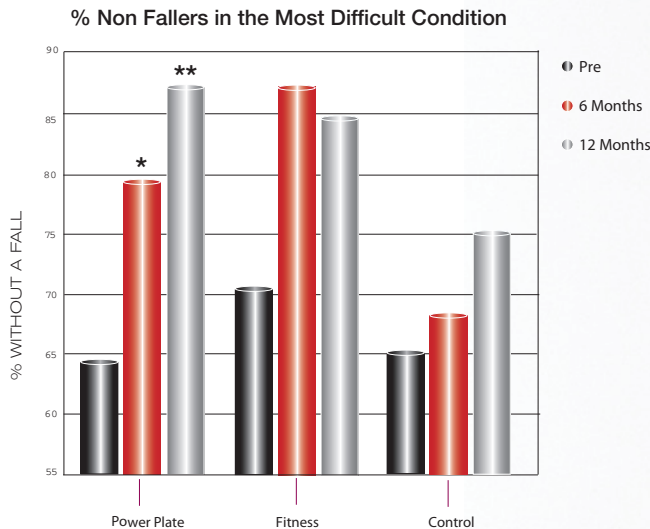
Deep Squat



Lunge

Figure 2

Percentage of subjects without a fall in the most challenging condition of the sensory test. In this condition, the support surface and visual surround moved in phase with the subject's sway resulting in inaccurate information delivered to eyes, feet and joints.



* significant effect between pre- and 6-month test
 ** significant effect between pre- and 12-month test

Results:

This is the first randomized controlled study investigating control. The results suggest that Power Plate training may contribute to improvements in some aspects of postural control in community dwelling individuals over 60 years of age.

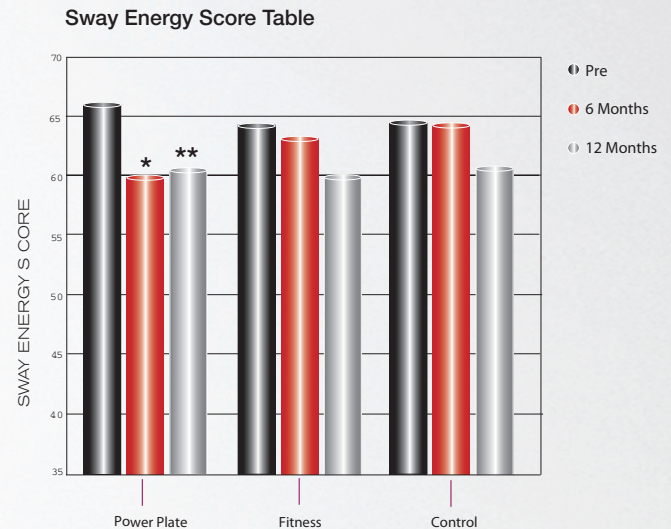
Some of the test didn't show results or only in the most challenging condition (see fig. 2). It is possible that some test were not challenging enough for healthy older persons to detect effects of training on postural sway with the healthy volunteers without any balance problems participated in this study.

The response to rotations improves in the toes up and toes down condition. In the toes up condition, the sway energy scores (SES) were not different between the three groups, although they were significant different in the toes down condition, with a significant improvement in the Power Plate group between pre- and 6-month test and pre- and 12-month test. The SES of the fitness and control group showed no significant changes over time (see fig. 3).

As the present study shows that Power Plate training in elderly women resulted in an improved (anticipatory) postural control, and previous studies have shown a strength and power increase, Power Plate training seems to be a useful tool in fall prevention training for the elderly population.

Figure 3

Sway Energy Scores (SES) in the toes down condition for the Power Plate, Fitness and Control Group at pre-, 6-months and 12 -months test.



Discussion and Conclusions:

After one year of Power Plate training, fall frequency reduced on a moving platform in the most challenging condition. Also the response to surface rotations was improved. The positive effects of Power Plate training on muscle strength seen in previous studies, its short training time and the encouraging trends seen in the present study, support the usage of the Power Plate by older individuals to stay fit, healthy and prevent falls.

This suggests that Power Plate training—which reduces falls and because of that risk of injuries, broken bones or other physical problems—result in better anticipatory postural control.