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# Research Review: Well Don't Just Stand There!

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# Research Review

## WELL DON'T JUST STAND THERE!

**Title:** Whole Body Vibration training increases muscle strength and mass in older women.

**Author:** Dr Machado et al (Institute of Biomedicine, University of Leon, Spain).

**Source:** *Scandinavian Journal of Medicine & Science in Sports*, 20 (2), 200-207, 2010

**Introduction:** Woe is me... It's the last week of teaching this semester at university and still so much to do before their final exams. But on the bright side I am off to a conference in sunny Queensland, and as luck would have it the itinerary has a trip to the Barrier Reef and a crocodile farm. It can't be all work you know.

Being the dedicated academic (i.e., nerd according to my girlfriend), I eagerly start reviewing the conference program and am pleased to see there is an entire symposium dedicated to whole body vibration (WBV). Even better, there are also a number of presentations on the research findings from both Australia and Germany relating to WBV and explosive power, functional adaptations and a review of the evidence of WBV.

I have been an advocate of WBV for quite some time now, as both a preventative and rehabilitative treatment. I have recommended that many patients utilise this training technique as either their sole mode of exercise training or, in most circumstances, in conjunction with a combined aerobic and progressive resistance training regime. This prescription has led to good results in both osteopaenic and osteoporotic patients.

Dr Machado and colleagues completed a ten-week training study which investigated the effects of WBV on muscular strength, muscle mass (thigh cross sectional area via computerised tomography), muscle power and mobility (timed 'up and go' test) in older females (65 to 90 years of age). Following medical approval to participate in the study, 26 female volunteers were randomly assigned to either 10 weeks of WBV exercise, or to a control group in which no change was made to existing lifestyle.

**Methodologies:** The WBV group training regime consisted of unloaded static and dynamic exercises, which included the following:

- ▶ Half squat (knee angle between 120° and 130°)
- ▶ Deep squat (knee angle 90°)
- ▶ Wide stance squat
- ▶ Calf raises.

An example of their training regime included the following:

Week 1: Three sessions per week, one set of 3 static exercises (squat, deep squat, wide squat) for 30 seconds each. The initial amplitude was 2mm, frequency 20Hz with three minutes rest between exercises.



**Results:** The authors reported a high compliance rate for the WBV group (95 per cent). Maximal voluntary isometric contraction – assessed via leg press – increased significantly in the WBV group (+38.8 per cent), and it also had a significant increase in cross sectional muscle area in the vastus medialis (+ 8.7 per cent), biceps femoris (+15.5 per cent) and in mobility (+9.0 per cent). Surprisingly, there were no significant differences in either muscle power or EMG activity.

**Discussion:** The authors concluded that this was the first long-term investigation into WBV training on muscle cross-sectional area, strength, power and mobility in older women. They further stated the major finding that the 10-week WBV training regime resulted in improved muscle strength induced by muscle thigh hypertrophy, which in turn was a result of the eccentric nature of the WBV and neural adaptations.

**Pros:** This was a well designed research study. I was pleased the authors reported there were no adverse side effects associated with the WBV training in this age group. The findings and lack of adverse side effects lends additional support to WBV as viable exercise training in mature-aged individuals to combat sarcopenia (degenerative loss of muscle mass and strength) and lower leg functional strength. I was also delighted the

authors chose to include both static and dynamic exercise in their training regime.

**Cons:** It would have been beneficial if the investigators had also assessed bone mineral density as traditionally the stance required is essentially stiff legged for the vibration to be beneficial to the femoral neck.

Although the authors employed the 'overload principle' with the WBV, which was accomplished with an increase in duration, amplitude (2 – 4mm), frequency (Hz, from 20 to 40) and the number of series of an exercise (1 – 2) or number of different exercises (3 – 4), it would have been interesting if the investigators would have also incorporated a weighted vest into the training regime (i.e., vest weight relative to body weight) to further improve muscle area and isometric force. Additionally, the investigators did not specify if all subjects were sedentary prior to participating. [1](#)



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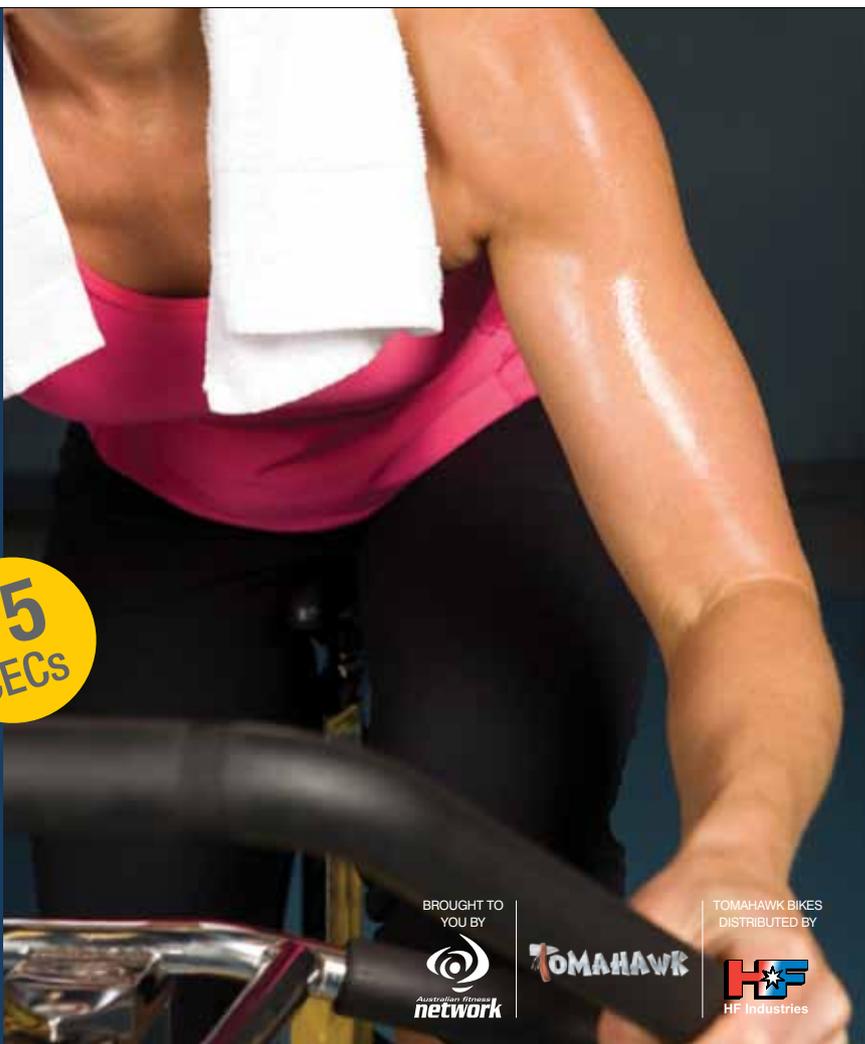
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