The Effect of Whole Body Vibration On Pain and Disability in Adults With Chronic Low Back Pain: A Systematic Review

Charles Lewis, SPT, Travis Fahey, SPT, Corey Pasquarelli, SPT, Matthew Donaldson, SPT, Renée Hakim, PT, PhD, NCS
Department of Physical Therapy, University of Scranton, Scranton, PA

BACKGROUND
Whole body vibration (WBV) consists of a patient sitting or standing on a vibrating platform. WBV has been reported to improve bone density and muscular strength, while decreasing muscular pain. When used for pain alleviation WBV elicits pain reduction via the Gate Control Theory. Chronic low back pain (CLBP) has been defined as persistent or recurrent back pain experienced by an individual for a period longer than 3 months.1 CLBP is one of the most common and widely experienced health related problems. It has been reported that the lifetime prevalence of low back pain is 85%. CLBP has been reported as the most common disability in those under age 45, posing the most expensive health care challenge in those between ages 20 and 50.1

PURPOSE
The purpose of this systematic review was to determine the effectiveness of whole body vibration (WBV) therapy as a treatment of chronic low back pain (CLBP) in adults.

MATERIALS
A literature search was conducted using Pubmed, CINAHL, Cochrane Library, and Google Scholar (2006-2016). We used the following search terms: (whole body vibration or vibration or vibration therapy) AND (back pain or low back pain or chronic back pain).

METHODS
Search limits included: English language, human subjects and peer-reviewed. Selection criteria included:(1) randomized controlled trials (RCT), (2) adults (>18 years) with reported CLBP, and (3) outcome measures of Oswestry Disability Index (ODI) and/or Visual Analog Scale (VAS). Two reviewers independently assessed each article for methodological quality and came to a consensus using PEDro guidelines.

RESULTS
A total of 64 articles were screened for eligibility. Following detailed appraisals, 4 RCTs met the criteria. PEDro scores ranged from 5-7 with an average score of 6. Sample sizes ranged from 21-50 participants. Treatment parameters varied widely with durations ranging from 2 to 12 weeks. Two of 4 studies showed statistically significant improvements using WBV. Intervention of standing on a WBV platform alone (total of 6 min @ 20 Hz, 2x weekly x 12 weeks) resulted in significant between-group improvements in both VAS (p=0.006 and ODI (p=0.013) scores vs. controls. Standing WBV (x 5min @18 Hz) followed by performance of spinal stabilization (SS) exercises (x SS min; 3x weekly x 6 weeks) resulted in significant between-group improvements in VAS scores (p<0.05) vs. exercise only controls, as well as significant within-groups improvements in both VAS and ODI scores (p<0.01). No statistically significant differences were found between or within groups on the VAS and/or ODI in 2 studies when WBV was performed concurrently with SS exercises (x 30-60 sec WBV @25-50Hz, 3x weekly x 20-35 min sessions x 2 - 8 weeks).

CONCLUSIONS
There is moderate evidence for WBV as a safe and effective method to decrease disability and pain scores in adults with CLBP when it is not performed concurrently with SS exercises. WBV performed alone or prior to SS exercise has shown positive results with significant reduction of pain and disability. Study limitations included small samples sizes, variable protocols, likelihood of co-interventions, and poorly operationalized SS exercise. Further research is needed to provide the most appropriate parameters for the optimization of WBV.

References: