

## Cochrane Corner



# Is whole body vibration exercise training effective and safe in fibromyalgia patients? A Cochrane Review summary with commentary

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The aim of this commentary is to discuss in a rehabilitation perspective the recently published Cochrane Review "Whole body vibration exercise training for fibromyalgia" by Bidonde J, Busch AJ, van der Spuy I, Tupper S, Kim SY, Boden C<sup>1</sup>, under the direct supervision of the Cochrane Musculoskeletal Group. This Cochrane Corner is produced in agreement with the Journal of Musculoskeletal and Neuronal Interactions (JMNI) by Cochrane Rehabilitation.

## Background

As defined by the diagnostic criteria of the American College of Rheumatology (ACR), fibromyalgia is characterized by chronic widespread pain in at least 4 of 5 regions and other symptoms as fatigue, waking unrefreshed and cognitive impairment for at least 3 months (Widespread Pain Index - WPI  $\geq 7$  and Symptom Severity Score - SSS  $\geq 5$  or WPI between 4–6 and SSS  $\geq 9$ ), irrespective of other diagnoses<sup>2</sup>. Worldwide prevalence varies across countries depending on the diagnostic criteria adopted, and is higher in females than males.

The pathophysiology of fibromyalgia is uncertain, but several pharmacological and rehabilitative treatments, including exercise, cognitive-behavioural therapy, and acupuncture are

prescribed to improve patients functioning and quality of life. Rehabilitation as the "medicine of functioning"<sup>3</sup> is described by the International Classification of Functioning, Disability and Health (ICF)<sup>4</sup> and it has been recently considered as the key health strategy of the 21<sup>st</sup> century addressing, among others, all chronic disabling conditions<sup>5</sup>.

Whole body vibration (WBV) exercise training is a forced mechanical oscillation that can be described in terms of direction, amplitude, frequency, acceleration, and body position on the platform. It has been used in different fields from training of elite athletes to treating patients with chronic pain conditions<sup>6</sup>.

The significant question addressed in this review of how WBV exercise training can improve quality of life and functioning in adults with fibromyalgia would be of prominent importance for physiatrists and other rehabilitation professionals that are often challenged with the treatment of this clinical condition.

## Whole body vibration exercise training for fibromyalgia

(Bidonde J, Busch AJ, van der Spuy I, Tupper S, Kim SY, Boden C, 2017).

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(see [www.cochrane.library.com](http://www.cochrane.library.com) for information). Cochrane Reviews are regularly updated as new evidence emerges and in response to feedback, and Cochrane Database of Systematic Reviews should be consulted for the most recent version of the review.



### What is the aim of this Cochrane review?

The aim of this Cochrane Review was to evaluate the benefits and harms of WBV exercise training in adults with fibromyalgia.

### What was studied in the Cochrane review?

The population addressed in this review included women with a diagnosis of fibromyalgia. The intervention studied was WBV with or without mixed exercise. Vibration frequency was 30 Hz in 2 studies with differing vertical amplitudes/displacements of 2 mm and 4 mm and 12.5 Hz and 20 Hz with vertical amplitude of 3 mm and with varying amplitude of 2-3 mm in the other 2 studies. WBV exercise training was conducted 2 to 3 times a week with a duration of 6 to 12 weeks. Comparators were only control as standard care (1 study) or WBV + mixed exercise including aerobic + flexibility + relaxation exercise vs. only mixed exercise (1 study) or WBV + mixed exercise vs. only mixed exercise (one study including placebo WBV) and control (2 studies). Major outcomes studied were Health-related Quality of Life (HRQL), physical function, pain intensity, fatigue, stiffness, number of participants who withdrew or dropped out, and number of adverse events; minor outcomes were muscle strength, balance, and number of participants with an improvement in pain greater than 30%.

### Search methodology and up-to-dateness of the Cochrane review?

The review authors searched for studies on MEDLINE, Embase, Cochrane Library, CINAHL, PEDro, Dissertation Abstracts (ProQuest), Current Controlled Trials, Clinicaltrials.gov, World Health Organization (WHO) International Clinical Trials Registry Platform, Allied and Complementary Medicine (AMED), Centre for Reviews and Dissemination, Agency for Healthcare Research and Quality Technology Assessments, Canadian Agency for Drugs and Technologies in Health, up to December 2016.

### What are the main results of the Cochrane review?

The review included 4 randomized controlled trials (RCTs), all conducted in Spain, with a total of 150 women (ages ranging from 52 to 62 years), with a diagnosis of fibromyalgia, according to the previous ACR criteria<sup>7</sup>.

- Only one RCT, including 41 participants, compared WBV only versus control, finding uncertain effects on HRQL and balance (very low quality evidence) and not measuring other outcomes.
- Two studies compared WBV plus mixed exercise versus control, however, there is still uncertainty, due to the very low quality of evidence, if WBV plus mixed exercise improves HRQL, pain intensity, fatigue, and stiffness (1 study with 21 participants), but not balance (1 study). Physical function, strength or greater than 30% improvement in pain were

not compared.

- The arms of three RCTs, compared WBV plus mixed exercise versus only mixed exercise or mixed exercise + placebo WBV, showing that WBV when added to mixed exercise may lead (very low quality evidence) to small improvements in pain intensity (1 study with 23 participants) but not on HRQL (2 studies with 49 participants for the arms), fatigue or stiffness (1 study with 23 participants), or strength and balance (2 studies with 54 participants). Data on physical function or greater than 30% improvement in pain were not reported.
- It was uncertain if there were any differences in withdrawals between groups.
- Uncertainty surrounds safety of WBV due to small number of reported adverse events in small studies including acute leg pain causing one participant to drop out and one attack of mild anxiety at the first session.

### How did the authors conclude?

The overall quality of evidence was very low, therefore it is uncertain whether WBV alone or in combination with exercise can be beneficial in terms of quality of life and functioning and safe in postmenopausal women diagnosed with fibromyalgia.

Considering the limited and very low quality of the available evidence, it is very likely that future research can change our understanding of the effects of WBV in adults with fibromyalgia.

### What are the implications of the Cochrane evidence for practice in rehabilitation?

This Cochrane review aimed to study effectiveness and safety of WBV for adults with fibromyalgia. The paucity (only 4 studies on 150 patients), lack of generalizability (all studies were conducted in Spain on middle-aged women), and overall very low quality of the available evidence, prevented the authors to draw any definitive conclusion.

Currently, there is no specific pharmacological or non-pharmacological treatment for fibromyalgia patients. The use of WBV exercise training in the treatment of fibromyalgia seems to be at the initiation phase with uncertainty of its effects on studied outcomes. The authors of this Cochrane review<sup>1</sup> suggests that further research needs to include diverse protocols of WBV in terms of the types of oscillating devices and varying frequencies and amplitudes among diverse groups of patients in terms of age, gender, and ethnicity as well as disease duration and severity including co-morbidities. From a rehabilitative perspective, being fibromyalgia a chronic health condition, affecting several aspects of functioning, including activity limitations and participation restrictions, it is important for rehabilitation professionals to continue with robust research, while considering safety, with a focus on functioning and using outcome measure based on the ICF<sup>8</sup>, as the assessment of functioning with the aim of improving is the starting point

of an individualized goal-oriented rehabilitation process<sup>9</sup>. The uncertainty of evidence points to the high likelihood of a change in evidence in future research.

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