Strength training effects of whole-body vibration?
Nordlund M M, Thorstensson A

CRD summary
This review evaluated the impact of whole-body vibration on jump performance and muscle strength. The authors concluded that whole-body vibration has no or only limited effect. The conclusions follow from the results. However, limitations in the reporting of the review process and the lack of a validity assessment make it difficult to assess the reliability of these conclusions.

Authors' objectives
To review the evidence for the effects of whole–body vibration (WBV) on strength and jump performance.

Searching
MEDLINE, PubMed, SPORTDiscus and EBSCO were searched from inception to August 2005; the search terms were reported. Only published full-length articles of original experiments were eligible for inclusion. Conference abstracts and proceedings were excluded. The reference lists of retrieved articles were checked.

Study selection
Study designs of evaluations included in the review
Studies using a control group were eligible for inclusion. There was insufficient information in the review to determine the exact design of the included studies.

Specific interventions included in the review
Studies of WBV used for repeated periods over at least 1 week were eligible for inclusion. Vibration parameters varied between the studies. The length of sessions ranged from 4 to 30 minutes and the majority of sessions were conducted three times a week (range: 2 to 5). Study duration ranged from 9 days to 8 months. In the majority of studies, the participants carried out body-loaded static and dynamic exercises whilst using the platform. In other studies the participants performed squats or static standing. Control groups either performed identical exercises or strength training, or were a passive control group.

Participants included in the review
Inclusion criteria for the participants were not stated. The majority of studies were of young mixed- or single-sex groups with a mean age ranging from 19.9 to 25.5 years. Three studies were of postmenopausal women with a mean age ranging from 60.7 to 64.6 years. The participants varied in their level of fitness.

Outcomes assessed in the review
Studies of the effects on muscle strength and/or jump performance were eligible for inclusion. The outcomes reported in the included studies were unilateral or bilateral isometric leg press, countermovement jump, grip strength, isometric and isokinetic unilateral knee extension and flexion strength, squat jump and squat.

How were decisions on the relevance of primary studies made?
The authors did not state how the papers were selected for the review, or how many reviewers performed the selection.

Assessment of study quality
The authors did not state that they assessed validity.

Data extraction
The authors did not state how the data were extracted for review, or how many reviewers performed the data extraction.

Methods of synthesis
How were the studies combined?
The results were combined in a narrative. Details of the studies and their results were tabulated.
How were differences between studies investigated?
The results were discussed separately for each control condition. Differences between the studies were evident from the table and the text.

Results of the review
Twelve studies (n=479) were included in the review. Four studies compared WBV alone with a control group performing identical exercises (n=79). Four studies compared WBV alone with a passive control group (n=154). Three studies compared WBV with both a passive control group and a strength training control group (n=179). One study compared WBV with a control group performing identical exercises, a passive control group and a strength training control group (n=67).

WBV compared with control group performing identical exercise (5 studies).
Only one study reported significant differences between the groups. This study found significantly improved jump height, isometric and dynamic strength, but no statistical data were reported. This study was performed on untrained women with a lower fitness level than the mixed groups included in the other studies.

WBV compared with passive control (8 studies).
The majority of studies found that WBV was significantly superior in improving jump height and strength.

WBV compared with strength training exercise (4 studies).
Most studies found no significant difference between the jump height and strength of participants using WBV and those using strength training.

Authors’ conclusions
WBV provides no or only minor additional effects on muscle strength and jump performance, at least in healthy fit people. The design of studies in older or sedentary groups was such that it was impossible to isolate the effects of WBV.

CRD commentary
Inclusion criteria for the intervention, study design and outcomes were clear. Inclusion criteria for the participants were undefined, although the authors took account of the wide variation in patient characteristics when drawing their conclusions. A broad search strategy was carried out, but the search was restricted to articles published in full and it is unclear whether language restrictions were applied, therefore important data might have been missed. There was insufficient information about the data extraction and study selection processes to rule out the possibility of error and bias. A validity assessment does not appear to have been carried out and there is insufficient information to determine the methodological quality of the included studies.

The decision to use a narrative synthesis was appropriate given the heterogeneity of the included studies. However, the inclusion of studies with control groups that did not perform identical exercises limits the ability to draw meaningful conclusions about the impact of WBV, as opposed to the impact of the exercises performed. Statistical measures of association were not reported for individual studies, making it difficult to assess the statistical significance of the results. Given the limited reporting of review methods and the lack of a validity assessment, the reliability of the authors’ conclusions is unclear.

Implications of the review for practice and research
Practice: The authors stated that there is no evidence to support recommending WBV training, at least in healthy fit people.

Research: The authors did not state any recommendations for research.
Funding
Swedish Centre for Sports Research.

Bibliographic details

PubMedID
17038159

DOI
10.1111/j.1600-0838.2006.00586.x

Original Paper URL

Indexing Status
Subject indexing assigned by NLM

MeSH
Exercise /physiology; Humans; Muscle Strength; Physical Education and Training /methods; Vibration

AccessionNumber
12007009044

Date bibliographic record published
07/02/2008

Date abstract record published
01/12/2008

Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.