The Effect of Whole Body Vibration on Pain and Disability in Adults with Chronic Low Back Pain: A Systematic Review
Authors

Travis Fahey, SPT
Matthew Donaldson, SPT
Charles Lewis, SPT
Corey Pasquarelli, SPT
Renée Hakim, PT, DPT, NCS
Whole Body Vibration (WBV)

- WBV treatment occurs when a patient sits or stands on a vibrating platform
- WBV has been reported to improve bone density, lower muscular pain, and muscle strength \(^1\)
- When used for pain alleviation, WBV elicits pain reduction via Gate Theory \(^1,2\)

Image from: http://www.trainingweightloss.com/product/confidence-pro-whole-body-vibration-machine-platform/
Prevalence

- Lifetime prevalence of low back pain is reported as high as 84% \(^3\)
- Prevalence of chronic low back pain approximately 23% \(^3\)
- 11-12% of population being disabled by low back pain \(^3\)
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.
Selection Criteria

● Diagnosis: Chronic Low Back Pain
● Age: Adults (≥ 18 years old)
● Outcomes: Oswestry Disability Index (ODI) Visual Analog Scale (VAS)
Search Terms

• (whole body vibration or vibration therapy or vibration)

  AND

• (low back pain or back pain or chronic back pain)
Search Limits

- Randomized Controlled Trials (RCT)
- Human subjects
- English language
- 2006-2016
<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baard et al.</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>6/10</td>
</tr>
<tr>
<td>Del-Pozo Cruz et al.</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>7/10</td>
</tr>
<tr>
<td>Torabi et al.</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>6/10</td>
</tr>
<tr>
<td>Yang et al.</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>5/10</td>
</tr>
</tbody>
</table>

Total = (24/40) 6/10
Results

● Two studies showed significant improvements in VAS and ODI using WBV (p<.05) \(^1,4\)
  - One study found between group significant improvements in both VAS and ODI (p=.006, p=.013) \(^4\)
  - One study found within group significant improvement in both VAS and ODI (p<.01) \(^1\)

● No statistically significant differences found for other two studies \(^5,6\)
Results

- Most effective programs included WBV followed by SS exercises and WBV alone
- SS exercises mainly composed of transversus abdominis (TrA) activation measured by a pressure biofeedback unit
Conclusion

- There is moderate evidence (PEDro=6/10) 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 spinal stabilization (SS) exercises.

- WBV performed alone or prior to SS exercise has shown positive results with significant reduction of pain and disability.
Clinical Implications

- The use of a WBV device may be limited as resources may not be readily available in many clinics. If available, application of WBV is feasible as it does not require much time or effort for implementation.

- The most effective treatment parameters for WBV were 18-20 Hz x 5-6 minutes total per session for 6-12 weeks duration \(^1 \text{,}^4\).

- If resources allow, physical therapists should consider the use of WBV therapy for patients with CLBP prior to SS exercises to optimize outcomes.
Limitations

- Small samples sizes
- Variable protocols
- Likelihood of co-interventions
- Poorly operationalized SS exercise
- Number of databases
Future research is needed to determine the potential benefits of WBV on a larger sample with more homogeneous samples using a standardized exercise protocol and outcomes.
Thank You

Renée Hakim, PT, Ph.D., NCS
Paul Sung, Ph.D.
Tracey Collins, PT, Ph.D., M.B.A., GCS
John Sanko, PT, Ed.D.
Bonnie Oldham
University of Scranton DPT Faculty
References


Questions?