**Article Full Title**

Immediate effects of a lumbar spine manipulation on pain sensitivity and postural control in individuals with nonspecific low back pain: a randomized controlled trial

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**Paper Abstract**

According to the American Physical Therapy Association, there is strong evidence to show that vertebral mobilization and manipulation procedures can be used to improve spinal and hip mobility and reduce pain and incapacity in low back pain patients that fit the clinical prediction rule. Objectives: To evaluate the immediate effects of high-velocity low-amplitude (HVLA) manipulation on pain and postural control parameters in individuals with nonspecific low back pain. This study used a participant-blinded and assessor-blinded randomized controlled clinical trial involving a single session, in which 24 participants were randomly distributed into control (simulated manipulation) and intervention (HVLA lumbar manipulation) groups. The primary (pain: subjective pain intensity and pressure pain threshold) and secondary outcomes (postural control: ellipse area, center of pressure [COP] excursion, COP RMS velocity, and differences between the COP and center of projected gravity) were evaluated before and after the session using a numerical pain scale, algometer, and a force platform. For all outcomes, multiple mixed 2 (group) x 2 (time) ANOVAs were performed. For the subjective pain intensity, only time was significant as a main effect, where pre-intervention presented a greater value then post-intervention (F [1.44] = 4.377; p = 0.042; r = 0.30). For the pressure pain threshold no significant effect was found. For the postural control parameters, as a main effect, only the ellipse area was significantly greater in the control group (F [1.44] = 6.760; p = 0.013; effect size = 0.36). There was a reduction in subjective pain intensity, evaluated using a numerical scale, in both the intervention and control groups immediately after the intervention, suggesting that the spinal manipulation had a similar effect to the placebo procedure. No effect of HVLA lumbar manipulation was identified for postural control variables in either the intervention or control groups.

**NIH Risk of Bias Tool**

Quality Assessment of Controlled Intervention Studies

1. **Was the study described as randomized, a randomized trial, a randomized clinical trial, or an RCT**

Yes

1. **Was the method of randomization adequate (i.e., use of randomly generated assignment)?**

Yes

1. **Was the treatment allocation concealed (so that assignments could not be predicted)?**

Yes

1. **Were study participants and providers blinded to treatment group assignment?**

Yes

1. **Were the people assessing the outcomes blinded to the participants' group assignments?**

Yes

1. **Were the groups similar at baseline on important characteristics that could affect outcomes (e.g., demographics, risk factors, co-morbid conditions)?**

Yes

1. **Was the overall drop-out rate from the study at endpoint 20% or lower of the number allocated to treatment?**

Yes

1. **Was the differential drop-out rate (between treatment groups) at endpoint 15 percentage points or lower?**

Yes

1. **Was there high adherence to the intervention protocols for each treatment group?**

Yes

1. **Were other interventions avoided or similar in the groups (e.g., similar background treatments)?**

Cannot Determine, Not Reported, or Not Applicable

1. **Were outcomes assessed using valid and reliable measures, implemented consistently across all study participants?**

Yes

1. **Did the authors report that the sample size was sufficiently large to be able to detect a difference in the main outcome between groups with at least 80% power?**

No

1. **Were outcomes reported or subgroups analyzed prespecified (i.e., identified before analyses were conducted)?**

Cannot Determine, Not Reported, or Not Applicable

1. **Were all randomized participants analyzed in the group to which they were originally assigned, i.e., did they use an intention-to-treat analysis?**

Yes

**Key Finding #1**

There was a significant reduction in subjective pain intensity for both control and intervention groups when comparing pre- and post-intervention, with no difference between groups.

**Key Finding #2**

There was no significant increase in pain threshold for either IG or CG, confirming that manipulation wouldn’t have an immediate effect on it.

**Key Finding #3**

Neither COP-related variables (ellipse area and total COP excursion) showed differences after the intervention.

**Key Finding #4**

**Please provide your summary of the paper**

This study shows that HVLA lumbar manipulation in individuals with LBP has no intervention specific effects on subjective pain intensity or pressure pain threshold. In regard to postural control variables, HVLA lumbar manipulation has no effects on posture either. The reduction seen in subjective pain intensity over time may be due to placebo or Hawthorne effect. The study has several limitations. The study was only a single intervention with no follow-ups and participant-blinding was not formally assessed. Also sample size calculation, subjective pain intensity, may have underpowered the study. Results regarding lack of difference between groups need to be interpreted with caution.

**Please provide your clinical interpretation of this paper. Include how this study may impact clinical practice and how the results can be implemented.**

This study shows that HVLA lumbar manipulation in individuals with LBP may not provide any intervention specific effects on pain intensity, pressure pain threshold, or postural control. If there are effects seen it may be due to a placebo or hawthorne effect. Due to various limitations in this study, further research is needed to understand how HVLA lumbar manipulation effects individuals with LBP. Due to the need for further research, this intervention might not be the first tool used for treatment in individuals with LBP during clinical practice.