

# **The influence of pelvic adjustment on vertical jump height in female university students with functional leg length inequality**

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This study aimed to investigate the effect of the pelvic adjustment on vertical jump heights in female university students with functional leg length inequality. Thirty female university students with functional leg length inequality were divided into a pelvic adjustment group (n = 15) and a stretching (control) group (n = 15). Vertical jump height was measured before and after the intervention.

## **KEY POINTS FROM THIS STUDY:**

- 1) Leg length inequality is easily observed clinically and causes functional disturbance of normal biomechanics.
- 2) Leg length inequality causes postural alterations, "causing tension of the muscles and other soft tissues." This is accompanied by clinical symptoms including low back and hip pain.
- 3) "Correcting leg length inequality reportedly reduces pain, increases mobility, and improves posture."
- 4) "The pelvis supports the abdomen, connects the spine and legs, and is involved in transferring weight from the spine to the legs when a person stands up, maintaining a straight posture and enabling smooth arm movements."
- 5) "Due to their erect ambulation, human beings are exposed to gravity and can thus be subject to a malalignment of the pelvis and legs affecting posture, ambulatory pattern, and balance."
- 6) "The position of the pelvis is the most critical factor determining the sagittal alignment and posture of the human body." Having the pelvis in the correct neutral position is required for optimal "daily movements and ambulatory ability."
- 7) When the pelvis is tilted, it causes a "functional leg length inequality."
- 8) The 30 subjects in this study all had a functional leg length inequality of more than 10 mm between the left and right legs. Leg length measurements were done supine, by tape, measuring the leg from the anterior superior iliac spine to the medial malleolus.

9) "High-velocity and low-amplitude adjustment has been widely utilized as a general chiropractic adjustment method." "The pelvic adjustment performed in the adjustment group consisted of a high-velocity and low-amplitude adjustment technique administered in the prone posture in accordance with Gonstead's theory."

10) The control group stretched the erector spinae, rectus abdominis, iliac muscle, psoas major, quadriceps muscle, leg adductor, and quadratus lumborum in order to resolve muscular imbalance that could further the pelvic imbalance.

11) "In the pre- and post-intervention comparison, vertical jump height improved significantly only in the adjustment group."

#### **Vertical Jump Height (cm)**

|            | Pre     | Post    | Improvement |
|------------|---------|---------|-------------|
| Adjustment | 23.7 cm | 27.3 cm | 3.6 cm      |
| Stretch    | 24.5 cm | 25.0 cm | 0.5 cm      |

#### **Measured Functional Leg Length Difference (mm)**

|            | Pre     | Post    | Improvement |
|------------|---------|---------|-------------|
| Adjustment | 13.4 mm | 5.1 mm  | 8.3 mm      |
| Stretch    | 13.3 mm | 11.1 mm | 2.2 mm      |

12) "In this study, stretching was not associated with increased vertical jump height, while pelvic adjustment was."

13) In this study, functional leg length inequalities were reduced after pelvic adjustment. "Pelvic adjustment balances the left and right pelvic height and left and right anterior and posterior rotation of the hip bones, which, in turn, leads to functional leg length inequality improvement." "This seems to explain the improvement in vertical jump ability."

14) "Pelvic adjustment as per the Gonstead method can be applied as a method of reducing functional leg length inequality and increasing vertical jump height."

15) The authors recommend that a Gonstead pelvic adjustment be applied for decreasing a functional leg length inequality and increasing vertical jump height.

#### **COMMENTS FROM DAN MURPHY**

In this study, a single Gonstead pelvic adjustment in asymptomatic subjects with a functional short leg significantly improved pelvic and muscle balance, resulting in a significant improvement in athletic performance.

Interestingly, the Gonstead chiropractic pelvic adjustment delivered in this case was delivered by a physical therapist with 10 years of clinical experience in doing so.