

# Changes in lower limbs reaction forces symmetry after Spinal Manipulative Therapy (SMT)

|                                        |                                                                |                                                                                                                                                                                                                                                     |
|----------------------------------------|----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Submission date</b><br>07/12/2017   | <b>Recruitment status</b><br>No longer recruiting              | <input type="checkbox"/> Prospectively registered<br><input type="checkbox"/> Protocol<br><input type="checkbox"/> Statistical analysis plan<br><input checked="" type="checkbox"/> Results<br><input type="checkbox"/> Individual participant data |
| <b>Registration date</b><br>12/12/2017 | <b>Overall study status</b><br>Completed                       |                                                                                                                                                                                                                                                     |
| <b>Last Edited</b><br>28/09/2021       | <b>Condition category</b><br>Nutritional, Metabolic, Endocrine |                                                                                                                                                                                                                                                     |

## Plain English summary of protocol

### Background and study aims

With the increase of the competitiveness and continuous search for the best performance, several athletes have been suffering repeated with biomechanics overload, creating muscle problems that negatively influence muscle strength and range of motion, affecting physical and sports performance, in training or competitions routine. This reality is considered problematic and generates a wide area of interest, with a continuous demand for technologies and therapeutics options, in favor of physical performance enhancement and prevention of injuries in athletes of different levels, conditions and sports. Spinal manipulation (a therapy that is performed on the spine by chiropractors) combines moving and jolting joints and massaging. Currently very little is known about the effects of spinal manipulative therapy in terms of performance tests symmetry on asymptomatic athletes. The aim of this study is to measure lower limbs reactions forces symmetry of athletes before and after lumbar SMT, through of the use of commonly used performance tests.

### Who can participate?

Athletes aged 18 to 35 older who have biomechanical dysfunction.

### What does the study involve?

Participant undergoes a Performance Test Assessment before and after receiving single session of lumbar (SMT). Participants are assessed for their balance, symmetry and their reaction forces.

### What are the possible benefits and risks of participating?

Participants may benefit from improvements in their symptoms. Participants may experience discomfort or injury during the SMT treatment.

### Where is the study run from?

University of Lisbon (Portugal)

### When is the study starting and how long is it expected to run for?

February 2017 to November 2017

Who is funding the study?  
Minister of Education Brazil – CAPES (Brazil)

Who is the main contact?  
Professor Bruno Alvarenga (Public)

## Contact information

**Type(s)**  
Public

**Contact name**  
Prof Bruno Alvarenga

**Contact details**  
Faculty of Human Kinetics - FMH (Biomechanics and Functional Morphology Laboratory (BFML))  
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## Additional identifiers

**Protocol serial number**  
01

## Study information

**Scientific Title**  
Changes in lower limbs reaction forces symmetry after lumbar Spinal Manipulative Therapy (SMT) in asymptomatic athletes: A Pilot Study

**Study objectives**  
Athletes have been exposed to an increasing training load and subsequent biomechanical overload due to a constant demand for performance enhancement. In this sense are observed an increased rate of musculoskeletal problems, including spinal biomechanical dysfunctions that are often asymptomatic. These dysfunctions are believed to negatively influence a wide range of mechanical and physiological parameters such as symmetry. Our hypothesis is if have causal association between lumbar SMT intervention and immediate changes of neuro-musculoskeletal system on performance tests assessments, namely in lower limbs reaction forces symmetry.

**Ethics approval required**  
Old ethics approval format

**Ethics approval(s)**  
Ethics Committee FMH (Faculty of Human Kinetics) - University of Lisbon, 19/09/2017, ref: 31 /2017

## **Primary study design**

Interventional

## **Study design**

Pilot study interventional non-randomised single-session single-centre open label trial subgroup analysis

## **Study type(s)**

Treatment

## **Health condition(s) or problem(s) studied**

Asymptomatic conditions were required of athletes participants.

## **Interventions**

Each participant undergoes a clinical and physical evaluation performed by one experienced health professional, to verify suitability for inclusion according to the eligibility criteria.

Lumbar SMT is performed on athletes participants between functional performance tests assessment, using Diversified techniques aiming to correct vertebral dysfunctional segments after clinical assessment.

Participants are asked to lay down prone on for spinal motion palpation analysis was performed in order to evaluate the presence of dysfunction in vertebral segments of lumbar spine . After that, SMT is performed with the athlete laying sideways while correction was done contacting the transverse process (mammillary) of the lumbar vertebrae, performing the lumbar roll technique, in all participants. SMT purpose is to correct spinal joints biomechanical dysfunctions using a high-velocity, low-amplitude movement, applied at the paraphysiological space, beyond the passive joint range of motion.

## **Intervention Type**

Procedure/Surgery

## **Primary outcome(s)**

Lower Limbs Ground Reaction Forces measured by the force platforms 5 minutes after lumbar SMT intervention.

## **Key secondary outcome(s)**

Kinetic Symmetry is measured using Symmetry Index (SI) at 5 min after lumbar SMT intervention.

## **Completion date**

15/11/2017

# **Eligibility**

## **Key inclusion criteria**

1. Athletes who presented asymptomatic lumbar biomechanical dysfunction
2. From any gender
3. Ages between 18-35 years old

## **Participant type(s)**

Healthy volunteer

**Healthy volunteers allowed**

No

**Age group**

Adult

**Lower age limit**

18 Years

**Upper age limit**

35 Years

**Sex**

All

**Total final enrolment**

13

**Key exclusion criteria**

1. Athletes with age superior to 35 years old
2. Have had any changes in their training routine or competition during the study
3. Those with previous spine surgery
4. Being treated at any time with manual therapy during the study

**Date of first enrolment**

15/03/2017

**Date of final enrolment**

15/05/2017

## **Locations**

**Countries of recruitment**

Portugal

**Study participating centre**

**University of Lisbon**

Biomechanics and Functional Morphology Laboratory

Faculty of Human Kinetics - FMH

Estrada da Costa - Dafundo

Lisbon

Portugal

1499-002

## **Sponsor information**

**Organisation**

University of Lisbon

**ROR**

<https://ror.org/01c27hj86>

**Funder(s)****Funder type**

Government

**Funder Name**

Minister of Education Brazil – CAPES

**Results and Publications****Individual participant data (IPD) sharing plan**

The datasets generated during and/or analysed during the current study are/will be available upon request from the study contact. Each individual data (Individuals' biomechanical outcomes will be presented for study participants, showing outcomes related to performances tests symmetry and therapeutic intervention), will be share, starting from day 15/12/2017, under previous communication and solicitation by study contact responsible personal, as indicated.

**IPD sharing plan summary**

Available on request

**Study outputs**

| Output type                    | Details | Date created | Date added | Peer reviewed? | Patient-facing? |
|--------------------------------|---------|--------------|------------|----------------|-----------------|
| <a href="#">Thesis results</a> |         | 15/03/2019   | 28/09/2021 | No             | No              |