

# Master track and field athletes' perception of multimodal chiropractic care on sports performance, and its impact on muscular capacities

<b>Submission date</b> 19/01/2022	<b>Recruitment status</b> No longer recruiting	<input checked="" type="checkbox"/> Prospectively registered <input checked="" type="checkbox"/> Protocol
<b>Registration date</b> 20/01/2022	<b>Overall study status</b> Completed	<input checked="" type="checkbox"/> Statistical analysis plan <input checked="" type="checkbox"/> Results
<b>Last Edited</b> 31/10/2025	<b>Condition category</b> Other	<input type="checkbox"/> Individual participant data

## Plain English summary of protocol

### Background and study aims

Athletes want to optimise their performance and prevent injuries, and they typically explore many different strategies to give them a competitive advantage in sports events. Worldwide, manual therapies and chiropractic have been increasingly used in sports to help elite and masters athletes with pain management, return to sports and rehabilitation after an injury, injury prevention, enhancement of performance, and to recover faster after competitions. Pre-competition chiropractic care may be a way to identify and prevent a potential injury and to contribute to enhancing sports performance in masters athletes. Although there is vast research addressing the role of the best and common practices of chiropractic in older adults, none of them so far have included the ageing athletic population until now.

Therefore, the aim of this study is to explore and increase the understanding of aged 60+ years athletes' perceptions of the chiropractic encounter, the biomechanical and sports performance experiences, and its potential short-term functional impacts on plantar flexor muscle strength and accuracy sensory motor skills.

### Who can participate?

Active track and field athletes aged 60 years and older from different clubs in the UK who compete at the national or/and international level from the disciplines of jumping, hurdling, sprinting, or distance running. Athletes with previous chiropractic care experience will be able to participate as the intervention group.

### What does the study involve?

This study investigates whether there is any short-term functional impact on plantar flexor muscle maximum isometric strength and accuracy sensori-motor skill performances after one session of chiropractic care before competition. The chosen control will be a passive rest (times between PRE1-PRE2 and PRE2-PRE3) to minimise any sham-treatment effects with 60-year-old and onward active adults (non-master athletes) as the control group. The study will be done at the track and field athletic venues or the chiropractic clinics at Friern Barnet or the City of

London. The study design consists of two stations. One is for the outcome measures and the second for the intervention/control. Biomechanical testing of the muscles takes 20 minutes and is performed three times: the start/baseline (PRE1 or T1), the middle (PRE2 or T2) and after the intervention (POST or T3) or rest control (PRE3 or T3). The entire procedure lasts 120 minutes.

What are the possible benefits and risks of participating?

It is expected that the evaluation and research process will contribute to our knowledge to offer guidelines to older master athletes and sports chiropractors. The study findings might be transferable to other master sports and manual therapy services working with an active ageing cohort.

Where is the study run from?

London South Bank University (UK)

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

July 2021 to June 2023

Who is funding the study?

Investigator initiated and funded

Who is the main contact?

Claudio Merkier

merkierc@lsbu.ac.uk

claudio.merkier@gmail.com

## Contact information

### Type(s)

Public

### Contact name

Mr Claudio Merkier

### ORCID ID

<https://orcid.org/0000-0003-0277-7190>

### Contact details

44 Glenthorne Road

London

United Kingdom

N11 3Hj

+44 (0)7787944910

claudio.merkier@gmail.com

### Type(s)

Scientific

### Contact name

Mr Claudio Merkier

### Contact details

London South Bank University  
103 Borough Road  
London  
United Kingdom  
SE1 0AA  
+44 (0)7787944910  
merkierc@lsbu.ac.uk

## **Additional identifiers**

**Clinical Trials Information System (CTIS)**  
2021-005437-17

**Integrated Research Application System (IRAS)**  
303735

## **Study information**

### **Scientific Title**

Older MAster Track and Field ATHletes PercEptions and Functional Impacts of PRe-Competition Chiropractic MAManual Therapies on Plantar FlexoR Muscle Strength, Accuracy Motor Skill and Sports PerformancE (MasterCare)

### **Acronym**

MasterCare

### **Study objectives**

Pre-competition chiropractic manual therapies improve maximum voluntary isometric contraction strength and accuracy motor coordination skill performances (slow and fast) more than rest control on plantar flexor muscles in healthy competing older masters track and field athletes.

### **Ethics approval required**

Old ethics approval format

### **Ethics approval(s)**

Approved 04/01/2022, Institute of Health and Social Care School of Ethics Panel at London South Bank University (Institute of Health and Social Care, London South Bank University, 103 Borough Road, London, SE1 0AA, UK; +44 (0)20 7815 7931; stewara2@lsbu.ac.uk), ref: ETH2021-0198

### **Study design**

Multicenter interventional pragmatic non-randomized feasibility trial

### **Primary study design**

Interventional

### **Study type(s)**

Treatment

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

Pre-competition sports performance

## Interventions

Current interventions as of 10/07/2023:

A 20-min session of chiropractic manual therapies (intervention) or 20 min of rest (control) prior to the participant's athletics competition event (not less than 24 hours).

This study is a non-randomised feasibility trial to investigate if there is any short-term functional impact on plantar flexor muscle strength and accuracy sensory-motor coordination performances after one session of chiropractic manual therapies prior to competition. The trial will be done at the track and field athletic venues or chiropractic clinics, within 24 hours prior to competing and during the 2022-23 seasons.

The trial protocol design consists of two stations. One is for the outcome measures and the second is for the intervention/control. The chosen intra-participant control will be a passive rest. Biomechanical testing includes maximum voluntary isometric contraction (MVIC) strength of plantar flexor muscles, slow (60 s) accuracy sensory-motor coordination performances of plantar flexor muscles (Slow delay: 60secs and fast delay: 15secs).

All the measurements of one round will take about 20 min. The biomechanical tests will be repeated three times: baseline (PRE1), middle (PRE2) and after (POST) intervention. The three biomechanical outcomes for the ankle plantar flexors are measured by a dynamometer and computer software (two custom-made strain gauge type dynamometers of 1,000 Hz, ankle and knee angle fixed at 90° to determine plantar-flexion moments and coordination for both legs separately and a visual feedback system developed with LabVIEW-2013 SP1-National Instruments, Austin, TX). The entire procedure will last 120 min. The biomechanical section of the protocol (20 mins) has already been tested in older adults as reliable and valid outcomes (Epro et al. 2018). The performance outcome measures will be analysed using SPSS, including the 95% confidence interval ( $p < 0.05$ ) and 80% power sample size calculations.

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Previous interventions as of 03/04/2023:

A 20-min session of chiropractic manual therapies (intervention) or 20 min of rest (control) prior to the participant's athletics competition event (not less than 24 hours).

This study is a non-randomised feasibility trial to investigate if there is any short-term functional impact on plantar flexor muscle strength and accuracy motor skill performances after one session of chiropractic manual therapies prior to competition. The trial will be done at the track and field athletic venues, within 24 hours prior to competing and during the 2022-23 seasons. The control group will be tested at Friern Barnet Chiro-Practice or at the biomechanical lab at London South Bank University.

The trial protocol design consists of two stations. One is for the outcome measures and the second for the intervention/control. The chosen control will be a passive rest to minimise any sham-treatment effects. Biomechanical testing includes maximum voluntary isometric contraction (MVIC) strength of plantar flexor muscles, slow (60 s) accuracy motor coordination skill performances (AMS-60) of plantar flexor muscles and fast (15 s) accuracy motor coordination skill performances (AMS-15) of plantar flexors muscles. All these measurements will take 20 min. The biomechanical tests will be measured three times: baseline (PRE1), middle

(PRE2) and after (POST) intervention. The three biomechanical outcomes for the bilateral ankle plantar flexor moment are measured by a dynamometer and computer software (two custom-made strain gauge type dynamometers of 1,000 Hz, ankle and knee angle fixed at 90° to determine plantar-flexion moments for both legs separately and a visual feedback system developed with LabVIEW-2013 SP1-National Instruments, Austin, TX). The entire procedure will last 120 min. The biomechanical section of the protocol (20 mins) has been already tested in older adults as reliable and valid outcomes (Epro et al. 2018). The performance outcome measures will be analysed by using SPSS by including the 95% confidence interval ( $p < 0.05$ ) and 80% power sample size calculations.

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Previous interventions as of 06/03/2023:

A 20-min session of chiropractic manual therapies (intervention) or 20 min of rest (control) prior to the participant's athletics competition event (not less than 24 hours).

This study is a non-randomised feasibility trial to investigate if there is any short-term functional impact on plantar flexor muscle strength and accuracy motor skill performances after one session of chiropractic manual therapies prior to competition. The trial will be done at the track and field athletic venues, within 24 hours prior to competing and during the 2022 season.

The trial protocol design consists of two stations. One is for the outcome measures and the second for the intervention/control. The chosen control will be a passive rest to minimise any sham-treatment effects. Biomechanical testing includes maximum voluntary isometric contraction (MVIC) strength of plantar flexor muscles, slow (60 s) accuracy motor coordination skill performances (AMS-60) of plantar flexor muscles and fast (15 s) accuracy motor coordination skill performances (AMS-15) of plantar flexors muscles. All these measurements will take 20 min. The biomechanical tests will be measured three times: baseline (PRE1), middle (PRE2) and after (POST) intervention. The three biomechanical outcomes for the bilateral ankle plantar flexor moment are measured by a dynamometer and computer software (two custom-made strain gauge type dynamometers of 1,000 Hz, ankle and knee angle fixed at 90° to determine plantar-flexion moments for both legs separately and a visual feedback system developed with LabVIEW-2013 SP1-National Instruments, Austin, TX). The entire procedure will last 120 min. The biomechanical section of the protocol (20 mins) has been already tested in older adults as reliable and valid outcomes (Epro et al. 2018). The performance outcome measures will be analysed by using SPSS by including the 95% confidence interval ( $p < 0.05$ ) and 80% power sample size calculations.

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Previous interventions:

A 20-min session of chiropractic manual therapies (intervention) or 20 min of rest (control) within the 24 h prior to the participant's athletics competition event.

This study is a non-randomised feasibility trial to investigate if there is any short-term functional impact on plantar flexor muscle strength and accuracy motor skill performances after one session of chiropractic manual therapies prior to competition. The trial will be done at the track and field athletic venues, within 24 h prior to competing and during the 2022 season.

The trial protocol design consists of two stations. One is for the outcome measures and the second for the intervention/control. The chosen control will be a passive rest to minimise any sham-treatment effects. Biomechanical testing includes maximum voluntary isometric contraction (MVIC) strength of plantar flexor muscles, slow (60 s) accuracy motor coordination skill performances (AMS-60) of plantar flexor muscles and fast (15 s) accuracy motor coordination skill performances (AMS-15) of plantar flexors muscles. All these measurements will take 20 min. The biomechanical tests will be measured three times: baseline (PRE1), middle (PRE2) and after (POST) intervention. The three biomechanical outcomes for the bilateral ankle plantar flexor moment are measured by a dynamometer and computer software (two custom-made strain gauge type dynamometers of 1,000 Hz, ankle and knee angle fixed at 90° to determine plantar-flexion moments for both legs separately and a visual feedback system developed with LabVIEW-2013 SP1-National Instruments, Austin, TX). The entire procedure will last 120 min. The biomechanical section of the protocol (20 mins) has been already tested in older adults as reliable and valid outcomes (Epro et al. 2018). The performance outcome measures will be analysed by using SPSS by including the 95% confidence interval ( $p < 0.05$ ) and 80% power sample size calculations.

## **Intervention Type**

Procedure/Surgery

## **Primary outcome(s)**

Current primary outcome measures as of 06/03/2023:

Measured by a dynamometer at baseline (PRE1), again after 20 min of rest (PRE2) and again after the chiropractic intervention (POST) or rest control (PRE3).

1. Maximum voluntary isometric contraction (MVIC) strength of the plantar flexor muscles
2. Slow accuracy motor skill (AMSS) performance of the plantar flexor muscles
3. Fast accuracy motor coordination skill (AMSF) performance of the plantar flexors muscles

Previous primary outcome measures from 20/05/2022 to 06/03/2023:

Measured by a dynamometer at baseline (PRE1), again after 20 min of rest (PRE2) and again after the chiropractic intervention (POST):

1. Maximum voluntary isometric contraction (MVIC) strength of the plantar flexor muscles
2. Slow accuracy motor skill (AMSS) performance of the plantar flexor muscles
3. Fast accuracy motor coordination skill (AMSF) performance of the plantar flexors muscles

Previous primary outcome measure:

Measured by a dynamometer at baseline (PRE1), again after 20 min of rest (PRE2) and again after the chiropractic intervention (POST):

1. Maximum voluntary isometric contraction (MVIC) strength of the plantar flexor muscles
2. Slow (60 s) accuracy motor skill (AMS-60) performance of the plantar flexor muscles
3. Fast (15 s) accuracy motor coordination skill (AMS-15) performance of the plantar flexors muscles

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

1. Expected and perceived impact of MVIC measured using the global perceived effect (GPE) of change (7 points Likert scale) at POST intervention at 100 min from the baseline
2. Expected and perceived impact of AMS-60 measured using the global perceived effect (GPE) of change (7 points Likert scale) at POST intervention at 100 min from the baseline
3. Expected and perceived impact of AMS-15 measured using the global perceived effect (GPE) of change (7 points Likert scale) at POST intervention at 100 min from the baseline

**Completion date**

30/06/2023

## Eligibility

**Key inclusion criteria**

Current inclusion criteria as of 06/03/2023:

1. Active track and field athletes from different masters athletics clubs in the UK who have been competing at regional, national or/and international levels (Intervention group)
2. Aged 60 years and older (intervention and control groups)
3. The main athlete's event is jumping, hurdling, sprinting, or distance running (intervention group)
4. The athlete has previous experience with chiropractic and manual therapies (intervention group)

Previous inclusion criteria:

1. Active track and field athletes from different masters athletics federation clubs in the UK who have been competing at regional, national or/and international levels
2. Aged 60 years and older
3. The main athlete's event is jumping, hurdling, sprinting, or distance running
4. The athlete has previous experience with chiropractic and manual therapies

**Participant type(s)**

Healthy volunteer

**Healthy volunteers allowed**

No

**Age group**

Senior

**Sex**

All

**Total final enrolment**

29

**Key exclusion criteria**

Current exclusion criteria as of 06/03/2023:

1. Athletes or older adults aged 60+ with a history of any surgery or Achilles tendon's ruptures and/or problems (tendinopathies etc) within a 6-month period prior to trial
2. The main athlete's event category is not jumping, hurdling, sprinting, or running (intervention group)
3. A score of 0, 1, or 2 in any item in the Lower Extremity Functional Scale (LEFS) (Binkley et al., 1999) during the recruitment process as a safety rule to minimise the risk of injury during the trial. A copy of the LEFS score will be sent to the potential participant by email or post in advance and completed at the beginning of the data collection research day

Previous exclusion criteria:

1. Athletes with a history of any surgery or Achilles tendon's ruptures and/or problems

(tendinopathies etc) within a 6-month period prior to trial

2. The main athlete's event category is not jumping, hurdling, sprinting, or running

3. A score of 0, 1, or 2 in any item in the Lower Extremity Functional Scale (LEFS) (Binkley et al., 1999) during the recruitment process as a safety rule to minimise the risk of injury during the trial. A copy of the LEFS score will be sent to the potential participant by email or post in advance and completed at the beginning of the data collection research day

**Date of first enrolment**

22/01/2022

**Date of final enrolment**

31/05/2023

## **Locations**

**Countries of recruitment**

United Kingdom

England

**Study participating centre**

**London South Bank University**

103 Borough Road

London

United Kingdom

SE1 0AA

**Study participating centre**

**Lee Valley Athletics Centre**

Lee Valley Leisure Complex

61 Meridian Way

Edmonton

London

United Kingdom

N9 0AR

**Study participating centre**

**Derby Athletics Club**

Moorways Stadium

Moor Lane

Allenton

Derby

United Kingdom

DE24 9HY

**Study participating centre**  
**Horspath Athletics and Sports Ground**  
Horspath Rd  
Oxford  
United Kingdom  
OX4 2RR

**Study participating centre**  
**The Pingles Stadium**  
Avenue Road  
Nuneaton  
United Kingdom  
CV11 4LX

**Study participating centre**  
**Battersea Park Millennium Arena**  
East Carriage Drive  
Battersea Park  
London  
United Kingdom  
SW11 4NJ

**Study participating centre**  
**Friern Barnet Chiro-Practice**  
44 Glenthorne Road  
Friern Barnet  
London  
United Kingdom  
N11 3HJ

**Study participating centre**  
**London City Chiro-Practice**  
20 Aldermanbury  
London  
United Kingdom  
EC2V 7HY

**Sponsor information**

## Organisation

London South Bank University

## ROR

<https://ror.org/02vwnat91>

## Funder(s)

### Funder type

Other

### Funder Name

Investigator initiated and funded

## Results and Publications

### Individual participant data (IPD) sharing plan

All IPD will be stored in a non-publicly available repository and will be kept strictly confidential (subject to legal limitations). Data generated by the study will be retained in accordance with the University's Code of Practice. Digital recordings and records will be stored on an LSBU password protected server accessible only by the project team. Non-anonymised data (personal data) data will be stored for exactly as long as it is needed in compliance with the General Data Protection Regulations. All personal data will be kept for a period of 10 years after the completion of the project and then destroyed. In the write up of the study, all data will be completely anonymised. No names or any identifiable information will be included.

### IPD sharing plan summary

Not expected to be made available, Stored in non-publicly available repository

### Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
<a href="#">Basic results</a>			27/08/2025	No	No
<a href="#">Participant information sheet</a>			23/06/2022	No	Yes
<a href="#">Protocol file</a>	Feasibility trial procedure		23/06/2022	No	No
<a href="#">Statistical Analysis Plan</a>			27/03/2023	No	No
<a href="#">Study website</a>	Study website	11/11/2025	11/11/2025	No	Yes