ISRCTN19833163 https://doi.org/10.1186/ISRCTN19833163

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

Submission date
19/01/2022

Recruitment status
No longer recruiting

Registration date
20/01/2022

Overall study status
Completed

Last Edited
31/10/2025

Condition category
Other

[X] Prospectively registered
[X] Protocol
[X] Statistical analysis plan
[X] Results
[_] 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 MAnual 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

Primary study design
Interventional

Study design
Multicenter interventional pragmatic non-randomized feasibility trial

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.

———

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.

———

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.

———

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?
Basic results			27/08/2025	No	No
Participant information sheet	Feasibility trial procedure		23/06/2022	No	Yes
Protocol file			23/06/2022	No	No
Statistical Analysis Plan			27/03/2023	No	No
Study website	Study website	11/11/2025	11/11/2025	No	Yes