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Assessment of the influence of core stability training on selected functional and structural parameters

Submission date
22/06/2020

Recruitment status
No longer recruiting

Registration date
30/07/2020

Overall study status
Completed

Last Edited
03/10/2022

Condition category
Musculoskeletal Diseases

[X] Prospectively registered

[_] Protocol

[_] Statistical analysis plan

[X] Results

[_] Individual participant data

Plain English summary of protocol

Background and study aims
Trunk rotations are important functional movements which form the foundations of the human motion pattern, especially in the functions of walking and running. The aim of this study is to assess how different kinds of core training improve abdominal muscle thickness, spinal range of motion, muscle power and muscle stiffness.

Who can participate?
Healthy people aged 18 - 45 years

What does the study involve?
The whole experiment will last for about 6-7 weeks. Every participant will go through a specific examination, including an interview, warm-up, functional tests, and self-made questionnaires. It will take up to 90 minutes. After that, patients will be randomly assigned to one out of three groups: two experimental groups provided with a specific training programme (local and global movement patterns), and one control group (without any training). The examination will be done at three times: on the first day (before training starts), after 4 weeks, and 2 weeks after the last training session. The study will include and assess two training concepts that develop central stabilization. The first group will focus on isolated transversus abdominis (TrA) muscle work and are taught how to do it. As soon as patients from the first group learn how to contract TrA (lying on their back), they will perform a specific training, including gentle breathing and moving upper and lower limbs. The same procedure will be repeated when sitting, standing, dynamic movements and walking. Training will be carried under the control of two physiotherapists. One of them will focus on providing cues, so the patient will perform movements properly, while the second therapist will perform feedback. Every patient will be treated individually. Training will last for 45-60 minutes. Patients from the second experimental group will also perform central stabilization training, but it will be based on global movements without isolated contraction of the so-called "core muscles". Patients will train under the control of two physiotherapists. One of them will be a strength and conditioning coach. Patients will perform a back-bridge, side-bridge, plank, quadruped, and torso rotations lying on their back. All exercises will be modified to increase or decrease difficulty and breathing will be underlined. Patients will train in a room

with mirrors, so they will be able to visually control their movements. Training will last for 45-60 minutes. Patients from both groups will train four times a week for 4 weeks.

What are the possible benefits and risks of participating?
Participants may have better stability. The researchers think that there is no risk of participating.

Where is the study run from?
Medical University of Silesia (Poland)

When is the study starting and how long is it expected to run for?
January 2015 to September 2020

Who is funding the study?
The Jerzy Kukuczka Academy of Physical Education (Poland)

Who is the main contact?
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Type(s)
Public

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Additional identifiers

EudraCT/CTIS number
Nil known

IRAS number

ClinicalTrials.gov number
Nil known

Secondary identifying numbers
KNW/0022/KB1/12/15

Study information

Scientific Title
Assessment of the influence of core stability training on selected functional and structural parameters among young healthy people

Study objectives
Do different stability trainings improve muscle thickness, spinal range of motion, muscle power, muscle stiffness?

Ethics approval required
Old ethics approval format

Ethics approval(s)
Approved 10/02/2015, Ethics Committee of Medical University of Silesia (Poniatowskiego 15, 40-055 Katowice; +48 (0)32 208 35 46; kombioet@sum.edu.pl), ref: KNW/0022/KB1/12/15

Study design
Double-blinded randomized control trial

Primary study design
Interventional

Secondary study design
Randomised controlled trial

Study setting(s)
GP practice

Study type(s)
Other

Participant information sheet
Not available in web format, please use the contact details to request a participant information sheet

Health condition(s) or problem(s) studied
Effects of core muscle training in healthy adults

Interventions
The whole experiment will last for about 6-7 weeks. Every participant will go through a specific examination, including an interview, warm-up, functional tests, and self-made questionnaires. It will take up to 90 minutes. After that, patients will be randomly assigned to one out of three groups: two experimental groups provided with a specific training programme (local and global movement patterns), and one control group (without any training). The examination will be done at three times: on the 1st day (before training starts), after 4 weeks, and 2 weeks after the last training session. The study will include and assess two training concepts that develop central stabilization. The first group will focus on isolated transversus abdominis muscle work and are taught (using palpation and USG-feedback method) how to do it. As soon as patients from the first group learn how to contract TrA (laying on their back), they will perform a specific training, including gentle breathing and moving upper and lower limbs. The same procedure will be repeated in sitting, standing, dynamic movements and walking. Training will be carried under the control of two physiotherapists. One of them will focus on providing cues, so the patient will perform movements properly, while the second therapist will perform a USG-feedback. Every patient will be treated individually. Training will last for 45-60 minutes. Patients from the second experimental group will also perform a central stabilization training, but it will be based on global movements without isolated contraction of the so-called "core muscles". Patients will train under the control of two physiotherapists. One of them will be a strength and conditioning coach. Patients will perform a back-bridge, side-bridge, plank, quadruped, and torso rotations lying on their back. All exercises will be modified to increase or decrease difficulty and breathing will be underlined. Patients will train in room with mirrors, so they will be able to visually control their movements. Training will last for 45-60 minutes. Patients from both groups will train four times a week for 4 weeks.

Intervention Type
Behavioural

Primary outcome measure
Measured on the 1st day (before training starts), after 4 weeks, and 2 weeks after the last training session (6 weeks after starting the experiment):
1. Muscle thickness measured using USG - Edan DUS 60 with linear transducer
2. Range of motion measured using inclinometer
3. Force applied during passive muscle stiffness testing measured using electronic dynamometer
4. Pain levels from last 7 days measured using McGill Pain Questionnaire Short-Form SF-MPQ

Secondary outcome measures
Measured on the 1st day (before training starts), after 4 weeks, and 2 weeks after the last training session (6 weeks after starting the experiment):
1. Body composition measured using Tanita body composition analyzer
2. Body fat measured using mechanical caliper
3. Distance in Thomayer’s test measured using self-made platform
4. Distance in modified Thomayer’s test (heel added) measured using FMS platform
5. Pain levels at a given moment, its change and its influence on the ability to perform daily

activities, measured using Revised Oswestry Low Back Pain Disability Scale
6. Level of physical activity measured using International Physical Activity Questionnaire (IPAQ)

Overall study start date
01/01/2015

Completion date
01/10/2020

Eligibility

Key inclusion criteria
1. Age 18 - 45 years
2. BMI less than 30 kg/m²

Participant type(s)
Healthy volunteer

Age group
Adult

Lower age limit
18 Years

Sex
Both

Target number of participants
120

Key exclusion criteria
1. Pain in the spine higher than 7/10 VAS
2. Neurologic symptoms
3. Abdominal surgery interventions in the past
4. Pregnancy
5. Chronic diseases
6. Pharmacotherapy

Date of first enrolment
31/07/2020

Date of final enrolment
15/08/2020

Locations

Countries of recruitment
Poland

Study participating centre
Medical University of Silesia
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Sponsor information

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Sponsor type
University/education

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Funder(s)

Funder type
University/education

Funder Name
The Jerzy Kukuczka Academy of Physical Education in Katowice

Results and Publications

Publication and dissemination plan
Planned publication in a high-impact peer-reviewed journal.

Intention to publish date
01/10/2020

Individual participant data (IPD) sharing plan

The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

IPD sharing plan summary

Available on request

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Results article		01/01/2021	03/10/2022	Yes	No