

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

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| <b>Submission date</b><br>22/06/2020   | <b>Recruitment status</b><br>No longer recruiting     | <input checked="" type="checkbox"/> Prospectively registered<br><input type="checkbox"/> Protocol |
| <b>Registration date</b><br>30/07/2020 | <b>Overall study status</b><br>Completed              | <input type="checkbox"/> Statistical analysis plan<br><input checked="" type="checkbox"/> Results |
| <b>Last Edited</b><br>03/10/2022       | <b>Condition category</b><br>Musculoskeletal Diseases | <input type="checkbox"/> 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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## Contact information

### Type(s)

Public

### Contact name

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## **Additional identifiers**

### **Clinical Trials Information System (CTIS)**

Nil known

### **ClinicalTrials.gov (NCT)**

Nil known

### **Protocol serial number**

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

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

Other

### **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(s)**

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

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

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)

## **Completion date**

01/10/2020

## **Eligibility**

### **Key inclusion criteria**

1. Age 18 - 45 years
2. BMI less than 30 kg/m<sup>2</sup>

**Participant type(s)**

Healthy volunteer

**Healthy volunteers allowed**

No

**Age group**

Adult

**Lower age limit**

18 years

**Sex**

All

**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**

Medyków 12

Katowice

Poland

40-752

**Sponsor information****Organisation**

The Jerzy Kukuczka Academy of Physical Education

# Funder(s)

## Funder type

University/education

## Funder Name

The Jerzy Kukuczka Academy of Physical Education in Katowice

# Results and Publications

## 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? |
|---------------------------------|---------|--------------|------------|----------------|-----------------|
| <a href="#">Results article</a> |         | 01/01/2021   | 03/10/2022 | Yes            | No              |