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Lift or stretch? That is the question

Submission date 23/04/2024	**Recruitment status** No longer recruiting	[_] Prospectively registered [_] Protocol [_] Statistical analysis plan [X] Results [_] Individual participant data
Registration date 24/04/2024	**Overall study status** Completed	
Last Edited 01/07/2024	**Condition category** Other	

Plain English summary of protocol

Background and study aims
Traditionally resistance training and static stretching are regarded as training methods focusing on different outcomes. However, in recent years research have shown that prolonged stretching might lead to hypertrophy which could induce increased muscle strength. Also, it has been reported that resistance training has led to increased flexibility. Therefore, it is of scientific and practical interest to examine the two training methods `effects on both flexibility and muscular strength. The aim of the present study is to compare the effects of eight weeks resistance training through full range of motion and static stretching of the hip and lower back extensors on flexibility and strength in healthy, physically active, adults.

Who can participate?
Healthy, physically active adults aged 18 - 50 years

What does the study involve?
After baseline testing, they will be randomized to either a resistance training group, a static stretching group or a control group. The resistance training group will perform three sessions per week consisting of two exercises for the hip extensors. The static stretching group will also conduct two sessions per week with the total training duration being equal to the resistance group. The control group will continue their normal activity. Testing will be conducted pre- and post-intervention. The outcomes are range of motion in hip flexion (sit and reach test) and maximal strength in the hip extensors (isometric straight legged deadlift).

What are the possible benefits and risks of participating?
The benefits of participating are that you get a designed training program and are being closely followed by a professional instructor throughout the intervention. Also, you will receive the final results and therefore have insight in the effects of the different training programs. Further you will be able to experience how a research project is conducted, if you are to conduct a similar project later.
The risks or disadvantages are that you have to follow the training plan and cannot train other types of training for the lower body outside the project.

Where is the study run from?
Western Norway University of Applied Sciences

When is the study starting and how long is it expected to run for?
January 2022 to December 2023

Who is funding the study?
Investigator initiated and funded

Who is the main contact?
Prof Vidar Andersen, vidar.andersen@hvl.no

Contact information

Type(s)
Public, Scientific, Principal investigator

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Additional identifiers

Clinical Trials Information System (CTIS)
Nil known

ClinicalTrials.gov (NCT)
Nil known

Protocol serial number
Nil known

Study information

Scientific Title
Comparison of resistance training vs static stretching on flexibility and maximal strength in healthy physically active adults, a randomized controlled trial

Acronym
LiSt

Study objectives

We hypothesize that both intervention groups will increase flexibility similarly and more than the control group. Further, we expect the resistance training group to increase maximal strength more than both the static stretching- and the control group

Ethics approval required
Ethics approval not required

Ethics approval(s)
Due to national legislation this project does not require approval from the regional ethical committee. Importantly, the procedures will be conducted in accordance with the guidelines set by Western Norway University College of Applied Sciences ethical review board and the Declaration of Helsinki.

Study design
Single-centre interventional randomized controlled trial

Primary study design
Interventional

Study type(s)
Efficacy

Health condition(s) or problem(s) studied
The study will examine muscular strength and flexibility in the hip extensors in healthy, physical active adults

Interventions
A randomized controlled trial will be conducted to answer the research question. After the pre-tests the participants will be randomly assigned to either a resistance training, a static stretching- or a control group by drawing notes from a hat.
The training intervention will last for eight weeks with three sessions per week. The training volume will have a linear progression (from four to eight sets) throughout the intervention. Importantly, the training volume and stretch intensity between the two intervention groups will be equal. Each session will be logged by the participants and supervised by a training instructor. Also, the same instructor will be present at all sessions during the first two weeks of the intervention to control and secure the understanding and execution of the two training programs.
The training exercises of the resistance training are the straight legged deadlift and the modified Jefferson curl while the Sit and Reach exercise is used for the static stretching.
The control group will continue their normal behavior.

Intervention Type
Behavioural

Primary outcome(s)
Maximal strength measured as newton in an isometric straight legged deadlift. Strength will be measured at both 90% and 50% of maximal range of motion, measured pre (the week before) and post (the week after) the intervention

Key secondary outcome(s))

Flexibility measured as centimetres stretched in the Sit and Reach test, measured pre (the week before) and post (the week after) the intervention

Completion date
15/12/2023

Eligibility

Key inclusion criteria
1 Healthy, physically active adult
2. Aged 18 - 50 years
3. No previous experience with the deadlift exercise

Participant type(s)
Healthy volunteer

Healthy volunteers allowed
No

Age group
Adult

Lower age limit
18 years

Upper age limit
50 years

Sex
All

Total final enrolment
18

Key exclusion criteria
1. Sickness or injury preventing them from performing training or testing.
2. Under the age of 18 years or over the age of 50 years
3. Not physically active
4. Familiar with the deadlift exercise

Date of first enrolment
30/06/2022

Date of final enrolment
15/08/2022

Locations

Countries of recruitment

Norway

Study participating centre
Western Norway University of Applied Sciences
Røyrgata 6
Sogndal
Norway
6856

Sponsor information

Organisation
Western Norway University of Applied Sciences

ROR
https://ror.org/05phns765

Funder(s)

Funder type
Other

Funder Name
Investigator initiated and funded

Results and Publications

Individual participant data (IPD) sharing plan
The datasets analysed during the current study are available upon request from Vidar Andersen (vidar.andersen@hvl.no). The researchers will be able to share the raw data on an individual level (in an anonymous form) or at group levels from the different tests. The data will be available after the publication of the article until 5 years after the publication date and shared with anyone as long as the requests are not restricted by Norwegian laws and regulations and the Western Norway University of Applied Sciences regulations. Since the participants have not given their consent to share the individual data, there may be restrictions regarding what data and to whom they can be shared. Therefore, please contact helene.pedersen@hvl.no for an update on the process.

IPD sharing plan summary
Available on request

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Results article		28/06/2024	01/07/2024	Yes	No
Participant information sheet	Participant information sheet	11/11/2025	11/11/2025	No	Yes