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Are shorter resistance training sessions better than longer?

Submission date
14/02/2022

Recruitment status
No longer recruiting

Registration date
15/02/2022

Overall study status
Completed

Last Edited
27/10/2022

Condition category
Other

[_] Prospectively registered
[_] Protocol
[_] Statistical analysis plan
[X] Results
[_] Individual participant data

Plain English summary of protocol

Background and study aims
Designing time-efficient training programs can be valuable to increasing participation and adherence to a strength training program. Briefer, more frequent weekly training sessions might allow for training with greater training loads compared to less frequent sessions of a longer duration, due to maximum energy use and reduced fatigue during exercise. It is possible that a higher session frequency would lead to shorter and more intense sessions with less accumulated fatigue, ultimately resulting in more work performed (i.e. a higher training volume). This may further result in greater muscular strength, muscle growth and power output.

Who can participate?
Healthy, adult females (over 18 years of age and have not reached menopause) with little experience in resistance training

What does the study involve?
The study involves resistance training twice or four times per week over a period of 12 weeks. Each muscle group will be exercised twice per week in both groups. Before and after the intervention, the participants will be tested for maximal strength, muscle mass and power output.

What are the possible benefits and risks of participating?
The participants will benefit from receiving a designed resistance training program and being trained by experts over a period of 12 weeks. They will get information about their physical condition and be informed of the effect of their training. There are always some risks related to training, but the health benefits surpass the risks.

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

When is the study starting and how long is it expected to run for?
January 2016 to December 2016

Who is funding the study?
Western Norway University of Applied Sciences (Norway)

Who is the main contact?
Helene Pedersen
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Contact information

Type(s)
Scientific

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Additional identifiers

Clinical Trials Information System (CTIS)
Nil known

ClinicalTrials.gov (NCT)
Nil known

Protocol serial number
48876

Study information

Scientific Title
A randomized trial on the efficacy of split-body versus full-body resistance training in non-resistance trained women

Acronym
CompFreq

Study objectives
The aim of the study is to examine the effects of performing two weekly total-body sessions versus four weekly split-body sessions, with an equated weekly training frequency per muscle group, on muscular adaptations in untrained women

Ethics approval required

Old ethics approval format

Ethics approval(s)
The study does not require ethics approval. Due to national requirements, ethics approval is only required when research is aimed at bringing new knowledge regarding sickness and health.

Study design
Randomised parallel trial

Primary study design
Interventional

Study type(s)
Other

Health condition(s) or problem(s) studied
Resistance training

Interventions
A randomized intervention trial was conducted to assess the efficacy of performing either a full-body (FB) resistance-training program twice per week, or a split-body (SPLIT) program four times per week over a 12-week study period. Each muscle group was exercised the same number of times per week (twice) for an equal number of sets and repetitions in both groups. Participants were pair-matched according to their baseline strength levels and then randomly assigned to one of the two experimental groups. The SPLIT group performed four exercises targeting the lower extremities twice per week and six exercises targeting the upper body twice per week. Alternatively, the FB group performed all ten exercises in the same session, with sessions carried out twice per week.

Maximal muscle strength (1-RM in leg press, Lat pulldown and bench press), muscle mass (bioelectrical impedance), jump height (CMJ) and power output in the bench press (at 15 kg) were tested pre- and post-intervention.

Intervention Type
Behavioural

Primary outcome(s)
Maximal strength measured as kilograms lifted in 1 repetition maximum (1-RM) tests in leg press, lat pulldown and bench press at baseline and after the 12-week intervention

Key secondary outcome(s))
1. Muscle mass measured in kilograms using bioelectrical impedance (Tanita MC780 multi-frequency segmental body composition analyzer) at baseline and after the 12-week intervention
2. Jump height measured in centimeters performing a countermovement jump on a force platform at baseline and after the 12-week intervention
3. Power output in the bench press measured in watts lifting a 15 kg barbell, calculated using a linear encoder measuring velocity and a commercial software program (MuscleLab Software v8. 13, Ergotest Technology AS, Langesund, Norway) at baseline and after the 12-week intervention

Completion date
20/12/2016

Eligibility

Key inclusion criteria
1. Female
2. Not performed strength training regularly the previous 6 months
3. Free of injury or pain that could impair performance during training or testing
4. Over 18 years of age, and had not reached menopause

Participant type(s)
Healthy volunteer

Healthy volunteers allowed
No

Age group
Adult

Lower age limit
18 years

Sex
Female

Total final enrolment
50

Key exclusion criteria
1. Male
2. Conducting resistance training on a weekly basis
3. Injuries or pains that impairs the training and/or testing
4. Under the age of 18 years or having reached menopause

Date of first enrolment
15/07/2016

Date of final enrolment
20/08/2016

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
University/education

Funder Name
Høgskulen på Vestlandet

Alternative Name(s)
Western Norway University of Applied Sciences, HVL

Funding Body Type
Government organisation

Funding Body Subtype
Universities (academic only)

Location
Norway

Results and Publications

Individual participant data (IPD) sharing plan
The datasets analysed during the current study are available upon request from Helene Pedersen (helene.pedersen@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		14/05/2022	27/10/2022	Yes	No