

# The effects of six months of progressive high effort resistance training methods upon strength, body composition, function, and wellbeing of elderly adults

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|----------------------------------------|---------------------------------------------------|---------------------------------------------------------------------------------------------------|
| <b>Submission date</b><br>06/04/2017   | <b>Recruitment status</b><br>No longer recruiting | <input type="checkbox"/> Prospectively registered<br><input type="checkbox"/> Protocol            |
| <b>Registration date</b><br>17/05/2017 | <b>Overall study status</b><br>Completed          | <input type="checkbox"/> Statistical analysis plan<br><input checked="" type="checkbox"/> Results |
| <b>Last Edited</b><br>17/05/2017       | <b>Condition category</b><br>Other                | <input type="checkbox"/> Individual participant data                                              |

## Plain English summary of protocol

### Background and study aims

Aging is associated with decline in physical function and so regular physical activity is recommended for older adults. In particular there is significant loss of strength and muscle mass and so 'muscle strengthening activities' such as resistance training are often recommended. An important factor in determining the success of resistance training programs might be the intensity of effort during training. However, this can be difficult for many individuals to accomplish, particularly if unsupervised. The aim of this study is to look at the effectiveness of a supervised resistance training program that progressively introduces higher effort training over a period of 6 months in older adults.

### Who can participate?

Adults aged 60 years and over who are in good health and have not previously engaged in resistance training.

### What does the study involve?

All participants take part in supervised resistance training sessions twice a week for six months. In these sessions, participants perform a 10 minute warm up, followed by completing exercises using gym equipment such as a keg press or chest press. The number of reps and load (weight) is gradually increased over the course of the program. At the start of the study, after the program (six months) and then again six months later, participants have their strength, body composition, wellbeing and function assessed using a range of assessment tasks.

### What are the possible benefits and risks of participating?

Participants benefit from being able to take part in supervised resistance training intervention, free for six months, which may result in improvements in strength, body composition, wellbeing, and function. The potential risks include injury or other complications as a result of the exercise program.

Where is the study run from?  
University of Koblenz-Landau (Germany)

When is the study starting and how long is it expected to run for?  
June 2012 to January 2014

Who is funding the study?  
University of Koblenz-Landau (Germany)

Who is the main contact?  
1. Dr James Steele (scientific)  
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# Additional identifiers

## Protocol serial number

SportsMedLandau2012-12-001

# Study information

## Scientific Title

In elderly adults does a progressive high effort resistance training intervention produce improvements in strength, body composition, function, and wellbeing, and are these maintained over a 6 month follow-up?

## Study objectives

A six month supervised progressive high effort resistance training intervention will significantly improve strength, body composition, function, and wellbeing of elderly adults, and these improvements will be maintained in those continuing with unsupervised training during a six month follow up compared with those ceasing training.

## Ethics approval required

Old ethics approval format

## Ethics approval(s)

Institute of Sport Science, University of Koblenz-Landau, Germany, 25/04/2012

## Primary study design

Interventional

## Study design

Prospective non-randomised study

## Study type(s)

Other

## Health condition(s) or problem(s) studied

Exercise

## Interventions

All participants take part in supervised training sessions conducted twice a week (at least 48 hours between sessions) for six months (25 weeks).

Participants all perform a general warm-up using either treadmill, cross-trainer, upright cycle ergometer, or recumbent cycle ergometer depending on preference for 10 minutes followed by a single set of moderate load leg press, chest press, and seated row for 15 repetitions prior to each training session. In each training session participants perform leg press, chest press, seated row, knee extension, knee flexion, trunk extension, and trunk flexion. The order of exercises is not fixed and depends upon preference and availability of equipment in the gym where training is conducted. Rest between exercises lasts for 2-4 minutes. Participants are instructed to perform the exercises using a relatively long repetition duration of at least 2 seconds concentric, 1 second pause at the top of the range of motion, and 2 seconds eccentric, and to not exceed 4 seconds concentric, 1 second pause at the top of the range of motion, and 4 seconds eccentric.

The first two weeks of the intervention is a familiarisation phase whereby participants trained using a single set of each exercise using a moderate load and performing 15-18 repetitions i.e. nRM. After this period participants progress for a further 2 weeks to perform each exercise to a set end of point of sdRM defined as cessation at the point where participants predict they would reach momentary failure if the next repetition was attempted. After this period participants progress to perform each exercise to a set end point of MF and continued training in this manner until week 18.

For the final 6 weeks of the intervention participants progress to perform each exercise to set end point of MF followed by a drop set whereby the load was reduced by ~5 kg and an additional set continued to the point of MF was performed immediately upon completion of the first. Load is progressed for each group by 2-10% in the next session if participants could achieve greater than 12 repetitions before reaching the defined set end point for their current period of training (in the case of the final 6 weeks this applied to the first set performed to momentary failure).

After the 25-week intervention participants wishing to continue performing resistance training unsupervised are given access to the training facility and allowed to train without direct supervision.

### **Intervention Type**

Other

### **Primary outcome(s)**

Strength (5 repetition maximum) is measured using leg press, chest press, and seated row exercises at baseline, 6 months (post-intervention) and 12 months (6 months follow up).

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

1. Body composition is measured using bioelectrical impedance at baseline, 6 months (post-intervention) and 12 months (6 months follow up)
2. Wellbeing is measured using the WHO-% Wellbeing Index at baseline, 6 months (post-intervention) and 12 months (6 months follow up)
3. Function is measured using a stair climb, carrying task, chair rise and grip strength at baseline and 6 months (post-intervention)

### **Completion date**

24/01/2014

## **Eligibility**

### **Key inclusion criteria**

1. At least 60 years of age
2. Present with a medical certificate verifying their otherwise good health
3. Not previously engaged in resistance training (RT)
4. No contraindication to participation in RT

### **Participant type(s)**

Healthy volunteer

### **Healthy volunteers allowed**

No

**Age group**

Senior

**Sex**

All

**Key exclusion criteria**

Participants were excluded if they had a pacemaker (due to the use of bioelectrical impedance analysis), failed to attend >4 training sessions, or did not meet the above criteria.

**Date of first enrolment**

10/12/2012

**Date of final enrolment**

21/12/2012

**Locations****Countries of recruitment**

Germany

**Study participating centre**

University of Koblenz-Landau

Institute of Sport Science

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Mainz

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**Sponsor information****Organisation**

University of Koblenz-Landau

**ROR**

<https://ror.org/01j9f6752>

**Funder(s)****Funder type**

University/education

**Funder Name**

University of Koblenz-Landau

## Results and Publications

**Individual participant data (IPD) sharing plan**

The datasets generated during and/or analysed during the current study are/will be available upon request from Dr James Steele (James.steele@solent.ac.uk)

**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> | results | 01/01/2017   |            | Yes            | No              |