Citation

Dennis Visser, Ewout B. Smit, Karin (H.L.) Gerrits. Effectiveness and characteristics of physical fitness training on cardiorespiratory fitness in older adults: a systematic review of systematic reviews. PROSPERO 2020 CRD42020140575 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42020140575

Review question
1. What is the effectiveness of physical fitness training on cardiorespiratory fitness compared to other or no training in adults over 65 years old?

2. What are the training characteristics that are associated with significant effects on cardiorespiratory fitness in adults over 65 years old?

3. Which recommendations for physical fitness training for older people over 65 can be made as a result of this umbrella review?

Searches
PubMed, EMBASE, CINAHL and the Cochrane Library.

Language restriction: English only.

Types of study to be included
Systematic reviews

Condition or domain being studied
This review studies the effects of physical fitness training on the cardiorespiratory fitness of older adults. There are many guidelines for this type of training in adults. This is not the case with older adults. This makes it difficult to draw up a scientifically based program for this type of training in geriatric rehabilitation. This review is a first step in the development of recommendations for physical fitness training for older adults.

Participants/population
The included review must present results of at least a subgroup of older adults aged 65 and older. There are no other criteria with regard to the population.

Intervention(s), exposure(s)
Physical fitness training aimed at improving or maintaining cardiorespiratory fitness.

Comparator(s)/control
The studies included in the included systematic reviews may be either randomised, quasi-randomised, non-randomised, or without a control intervention.

Context
Inclusion criteria:

- We will include systematic reviews of intervention studies. Reviews will be classified as systematic if they at least fulfill the following criteria: description of a search strategy and in- and exclusion criteria. The studies included in the included systematic reviews may be either randomised, quasi-randomised, non-randomised, or without a control intervention. Cardiorespiratory fitness is measured at least before and after the intervention

- The intervention is a physical training that is expected to improve cardiorespiratory fitness
PROSPERO International prospective register of systematic reviews

- The description of the intervention must contain at least one of the following: Frequency, Intensity, Time or Type of exercise

Exclusion criteria:

- Systematic review does not report an intervention
- Insufficient description of the intervention in the systematic review
- No cardiorespiratory outcomes

Main outcome(s)
The outcome numbers correspond with the research questions.

1. The described outcomes are focused on fitness and have been measured at least twice so that they actually show the effect of the training on fitness. Think of:

a. Cardiorespiratory function:
   i. Heart rate response
   ii. VO2 max
   iii. VO2 peak
   iv. Muscle fatigue

b. Performance:
   i. 2/4/6 Minute Walking Test
   ii. Endurance capacity
   iii. Exercise tolerance

c. Any other outcome measure that describes cardiorespiratory fitness

2. Training characteristics will be described using Frequency, Intensity, Time and Type of exercise (FITT-criteria).

Measures of effect
None

Additional outcome(s)
Quality of the reviews

Measures of effect
Not applicable

Data extraction (selection and coding)

1. Two reviewers (DV, EBS) independently screen titles and abstracts of the full list and agreement has to be reached before the article will be subjected to a full-text assessment. In case, an article is only selected by one reviewer a discussion will take place between the two reviewers to determine whether the study should be selected for a full-text analysis. In the case that consensus cannot be reached than the article will be included for full text analysis.

2. Next, both reviewers independently assess the full text of the selected articles. In case, an article is only selected by one reviewer a discussion will take place between the two reviewers to determine whether the...
study should be included in the review. A third reviewer (HLG) will be consulted in case that the two reviewers cannot reach consensus on inclusion.

3. The two reviewers independently assess the review quality and extract the data from each included review. The results of the quality assessment and data extraction will be compared and discrepancies will be resolved through discussion.

4. The methodological quality of the reviews will be determined by A MeaSurement Tool to Assess systematic Reviews (AMSTAR 2)?

5. The validated JBI Data Extraction Form for Systematic Reviews and Research Syntheses* will be used for data extraction. Two authors will independently undertake this process. Characteristics of studies will be tabulated as:

a. Review characteristics: author/year, objectives, participants (characteristics/total number), setting/context, interventions of interest, number of databases/sources searched, date range of included studies, number of total studies included, detailed description of the included primary studies related to healthy eating promotion (number/type of studies/country of origin), appraisal instrument and rating, method of analysis and outcomes assessed; and

b. Review Results:

i. Effect of training on cardiorespiratory fitness

ii. Training characteristics using the FITT-criteria


Risk of bias (quality) assessment
A MeaSurement Tool to Assess systematic Reviews 2 (AMSTAR 2)*.


Strategy for data synthesis
No meta-analysis will be performed. Due to the expected large differences between the different groups of elderly people and the different types of physical fitness training, these will not be sufficiently comparable. Therefore we will use a narrative synthesis to describe the results of the included reviews on the effect of training and the training characteristics including FITT-criteria (see question #26). The results of the quality assessment will also be reported in this synthesis. There are no limitations to the data synthesis, this mean that there will not be a minimal number of systematic reviews as well as number of studies in the included reviews. Furthermore, data synthesis will include studies of all quality levels, however the risk of bias and its impact on the data synthesis will be reported.

Analysis of subgroups or subsets
If sufficient articles are found, the results may be broken down by patient group (for example stroke patients or patients after an orthopedic procedure). The results will be described in the same way as stated under the heading data extraction, only per patient group.

Contact details for further information
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Type and method of review
Intervention, Narrative synthesis, Review of reviews, Systematic review

Anticipated or actual start date
08 May 2019

Anticipated completion date
08 May 2020

Funding sources/sponsors
ZonMw (national funding body for medical research)
Postbus 93245
2509 AE Den Haag
Projectnumber: 839120007
Gerion (educational institute for the training of elderly care physicians)
Postbus 7057
1007 MB Amsterdam

Conflicts of interest
None known

Language
English

Country
Netherlands

Stage of review
Review Ongoing

**Subject index terms status**
Subject indexing assigned by CRD

**Subject index terms**
Adult; Cardiorespiratory Fitness; Exercise; Humans; Physical Fitness

**Date of registration in PROSPERO**
13 March 2020

**Date of first submission**
12 July 2019

**Stage of review at time of this submission**

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The record owner confirms that the information they have supplied for this submission is accurate and complete and they understand that deliberate provision of inaccurate information or omission of data may be construed as scientific misconduct.

The record owner confirms that they will update the status of the review when it is completed and will add publication details in due course.

**Versions**

13 March 2020