Frail institutionalized older persons: a comprehensive review on physical exercise, physical fitness, activities of daily living, and quality-of-life

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CRD summary
The review concluded that physical training had significant positive effects on physical fitness outcomes in frail elderly people in long-term care institutions. Potential for biases within the review, poor reporting and the variability in interventions and outcomes reported mean that caution is warranted when interpreting the authors’ conclusions and recommendations.

Authors’ objectives
To assess the effects of exercise training and physical activity on physical fitness, activities of daily living (ADL) and quality of life in institutionalised older people.

Searching
PubMed, CINAHL and The Cochrane Library were searched from 1955 to 2008 for articles published in English. Search terms were reported. Reference lists of included articles and related articles were searched.

Study selection
Randomised controlled trials (RCTs) that examined the effects of exercise training or physical activity on physical fitness in adults age 70 years or older who were in long-term care facilities and nursing homes were eligible for inclusion. The relevant outcomes included balance, ADL, disability, co-ordination, endurance, flexibility, muscle strength, frailty, physical activity, functional performance and institutionalisation (defined in the review). Studies on the effects of physical activity on the prevention of falls were eligible for inclusion. Studies with a primary focus on specific diseases (such as Alzheimer’s and stroke) were excluded.

The included trials studied range of motion, balance training, resistance training, functional training, Tai Chi, strength training, endurance training, flexibility training and gait training alone and in combination. The intensity and duration of interventions varied.

The authors did not state how many reviewers performed study selection.

Assessment of study quality
Quality assessment was conducted using an adapted Dutch Cochrane checklist of randomisation, blinding, baseline characteristics, loss to follow-up, intention-to-treat and equal treatment of groups to give a maximum score out of 12. Trials were scored as high quality (9 to 12), moderate quality (5 to 8) and low quality (zero to 4).

The authors did not state how many reviewers performed quality assessment.

Data extraction
Data were extracted on means and standard deviations of various physical fitness outcome measures and these were used to calculate effect sizes.

The authors did not state how many reviewers performed data extraction.

Methods of synthesis
A narrative synthesis was presented. Studies were grouped by outcomes. Effect sizes were classified as limited effects (0.0 to 0.2 effect size), moderate effects (0.2 to 0.5 effect size), strong effects (0.5 to 0.8 effect size) and very strong effects (0.8 to maximum effect size). Trials deemed to be low quality were excluded from the synthesis.
Results of the review
Twenty-seven trials were included in the review (12 trials with data that allowed calculation of effect sizes). Three trials were graded as low quality, 12 were deemed moderate quality and 12 were high quality. Study sample sizes ranged from 20 to 981 participants.

Four trials showed strong to very strong effects and five trials showed moderate or limited effects on strength. Two trials showed moderate effects on flexibility, two trials showed mixed effects on quality of life and one study showed mixed effects on co-ordination. Four trials showed strong to very strong effects and eight trials showed moderate or limited effects on functional performance. One trial showed strong to very strong effects, five trials showed moderate or limited effects and one trial showed adverse effects on ADL performance. One trial showed strong to very strong effects and nine showed moderate to limited effects on balance.

Authors’ conclusions
Physical training had significant positive effects on physical fitness outcomes, ADL and quality of life in frail elderly people in long-term care institutions.

CRD commentary
Inclusion criteria for the review were reasonably clearly defined. Several relevant data sources were searched for published studies. There was the potential for language bias as only articles in English were included. Publication bias was not assessed and could not be ruled out. It was unclear whether attempts were made to reduce risks of reviewer error and bias during the review process. Study quality was assessed using a standard checklist. Low-quality trials were excluded from the analysis. Only high-quality trials were used for research recommendations. The included trials were highly variable in terms of interventions and outcomes and limited details were provided. A narrative synthesis was presented and studies were grouped by outcome, which was appropriate given the type of data available.

Potential for biases within the review, poor reporting and the variability in interventions and outcomes reported mean that caution is warranted when interpreting the authors’ conclusions and recommendations.

Implications of the review for practice and research
Practice: The authors stated that exercise training programmes for frail elderly people should contain a combination of progressive resistance training, balance training and functional training. The proposed intensity was moderate to high assessed on a zero to 10 scale for muscle strengthening activities.

Research: The authors did not state any implications for research.

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