Efficacy of progressive resistance training interventions in older adults in nursing homes: a systematic review

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**CRD summary**
This review concluded that significant improvements in muscle strength and functional performance occurred with progressive resistance training in older institutionalised adults. The review was limited by small sample sizes, by differences in the interventions and outcomes, and by unclear reporting of the results. Given these concerns, the author’s conclusion may be overly optimistic and should be interpreted with caution.

**Authors’ objectives**
To determine whether progressive resistance training, as a single exercise intervention, improves strength and functional performance in older institutionalised adults.

**Searching**
Nine databases (including MEDLINE, PsycINFO, CINAHL and DARE) were searched from inception to July 2011 for articles in any language. Search terms were reported. Reference lists of retrieved articles and reviews were also searched.

**Study selection**
Clinical trials of progressive resistance training in older adults living in a nursing home or similar age-care institution were eligible for inclusion. Studies that included other forms of resistance training were included if the effects of progressive resistance training could be isolated. Trials that included other forms of exercise (such as aerobic) were excluded. Trials in which participants in the control group participated in usual care or similar activities were considered. The relevant outcomes included strength and functional performance.

The included trials studied progressive resistance training of both the upper and lower body, or the lower body only; one trial studied training the upper body only. All training sessions were supervised and performed in the institution. Training sessions lasted between 30 and 60 minutes; most took place three times a week. The control group included exercise-related interventions (such as walking) and recreational activities (such as reading). The mean age of participants ranged from 70 to 90 years. Trial duration ranged from two to 12 months.

One reviewer undertook study selection.

**Assessment of study quality**
Quality assessment was undertaken using a modified form of the Pedro scale, which appraised 11 quality items, including blinding and randomisation, to give a maximum score out of 11.

One reviewer performed quality assessment.

**Data extraction**
Data were extracted on strength and functional performance outcomes. Where data were not reported, there were no calculations or adjustments.

One reviewer extracted the data.

**Methods of synthesis**
A narrative synthesis was presented, grouping studies by high, moderate and low intensity progressive resistance training.

**Results of the review**
Thirteen trials were included (673 patients) comprising nine randomised controlled trials (RCTs), two controlled
clinical trials, and two non-controlled trials. Trial sample size ranged from 10 to 191 participants. The quality of the trials ranged from 7 to 11 points.

It appeared that five trials showed significant improvements in upper or lower body strength related outcomes with high intensity progressive resistance training compared with control. Moderate intensity progressive resistance training also showed a significant effect on strength rated outcomes; low intensity exercise showed mixed effects. The effects on functional outcomes (such as climbing power and chair-rising) were mixed.

**Authors' conclusions**

Significant improvements in muscle strength and functional performance occurred in response to progressive resistance training in older institutionalised adults.

**CRD commentary**

Inclusion criteria for the review were clearly defined. Multiple relevant databases were searched for articles in any language. Publication bias was not assessed and could not be ruled out. Only one reviewer was involved in the review processes, which may have introduced error and bias into the review.

Quality assessment of the included studies indicated that the evidence was generally of good quality. A narrative synthesis was presented, but there was a lack of clarity in the reporting which made it difficult to interpret results. The authors noted that the review was limited by small sample sizes, and by the wide range of different intensity interventions and different outcome measure used.

Given these concerns, the author's conclusions may be overly optimistic for the evidence presented, so a degree of caution is warranted when interpreting the review.

**Implications of the review for practice and research**

**Practice**: The authors stated that progressive resistance training should be promoted and incorporated into the recreational schedule of older institutionalised adults.

**Research**: The authors stated that future trials should aim to provide information on drop-outs, adherence, compliance, adverse events, and intention-to-treat analysis. Exercise interventions of a longer duration and higher intensity should also be studied to determine the exercise tolerance and adherence to exercise in this population.

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