Efficacy of physical exercise intervention on mobility and physical functioning in older people with dementia: a systematic review

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CRD summary
The review concluded the high-quality studies demonstrated fairly consistently that intensive physical rehabilitation enhanced mobility and, when administered over a long period, may also improve the physical functioning of older patients with dementia. The authors’ conclusions appear overoptimistic given the overall strength of the evidence, and may not be reliable.

Authors’ objectives
To evaluate the effectiveness of physical exercise interventions on mobility and physical functioning in older people with dementia.

Searching
PubMed, Cochrane (details not specified), DARE, CINAHL and Nursing@Ovid databases were searched to September 2011 for publications in English. Search terms were reported. Reference lists of retrieved articles and relevant systematic reviews were also examined.

Study selection
Randomised controlled trials (RCTs) that evaluated the effect of physical activity interventions on mobility and physical functioning in older people with dementia were eligible for inclusion. Physical exercise (of any type) had to be the main intervention, either alone or in combination with other interventions.

Exercise types varied and included endurance, strength, and balance/coordination training; and functional exercise. Time, frequency and duration varied widely between trials. Exercises were performed either individually or in groups with or without a professional supervisor. Many interventions were multimodal. Trials were conducted in a number of countries including the UK, France, Germany and the USA, where reported. Participants had a mean Mini-Mental-State-Examination Score (MMSE) of 3 to 24, where reported. The mean age of participants was 74 to 87, where reported. Most participants in the trials were women. Trials were published between 1994 and 2010.

Multiple reviewers (exact number unclear) selected the studies for inclusion.

Assessment of study quality
Study quality was assessed using modified Cochrane, PEDro and Evidence-based Medicine Working Group criteria which included: randomisation, blinding, well-defined diagnosis of dementia, adequate description of inclusion/exclusion criteria and intervention, statistical power, defined and valid outcome measures, groups comparable at baseline, description of drop-outs, intention-to-treat analysis, comparable outcome variables, compliance of participants and reporting of complications. Studies that scored more than ten out of a maximum of 13 points were considered high quality; seven to 10 points were considered moderately high quality and below seven points were considered poor quality. Evidence of efficacy was based on the GRADE working group criteria. Four reviewers independently assessed quality. Disagreements were resolved through discussion.

Data extraction
The authors did not state how data were extracted or how many reviewers extracted data.

Methods of synthesis
The studies were described narratively and grouped into studies conducted in participants living in institutional care, or community-dwelling participants.

Results of the review
Twenty RCTs (1,378 participants) were included in the review. Sample sizes ranged from 12 to 274. Three trials were
judged to be high quality, six to be moderate quality and 11 to be poor quality.

Institutional care (10 RCTs, 575 participants): One high-quality RCT reported a slower decline in physical functioning in participants with dementia as a result of a physical activity intervention, while one moderate quality RCT reported a slower decline in mobility as a result of the intervention. Among the seven poor quality RCTs, physical activity interventions were associated with improvements or slower declines in several outcomes, including mobility (four RCTs), balance (one RCT), muscle strength (one RCT), and physical functioning (three RCTs). One poor quality RCT demonstrated improvements or slower decline in multiple functional limitations as a result of the intervention; this included balance, muscle strength, flexibility and gait. One poor quality RCT reported no differences between groups for mobility (ambulation) and two RCTs reported no differences for physical functioning.

Home-dwelling (10 RCTs, 803 participants): Two high-quality RCTs reported positive effects on functional limitations in participants with dementia in physical exercise groups compared to control groups. Four of five moderate RCTs also reported improvements in functional limitations (one RCT) or mobility (three RCTs) for physical exercise groups. Three of the moderate quality groups found no significant differences between groups for physical functioning (two RCTs) or mobility (one RCT). Three poor quality RCTs reported mixed effects with one RCT reporting improvements in physical functioning as a result of physical exercise, but two poor quality trials found no differences between groups in mobility.

Other outcomes were reported in individual studies.

Authors' conclusions
The high-quality studies demonstrated fairly consistently that intensive physical rehabilitation enhanced mobility and, when administered over a long period, may also improve the physical functioning of older patients with dementia.

CRD commentary
The review questions and inclusion/exclusion criteria were broadly reported. Several relevant sources were searched. No specific attempts were made to locate unpublished data and this, together with limitation of only including articles in English meant some studies may have been missed. Study quality was assessed and results broadly reported. The authors also incorporated study quality into the synthesis. Appropriate methods to reduce reviewer error and bias were used in the quality assessment and study selection but it was unclear whether similar methods were used in the data extraction. A narrative synthesis was appropriate given the variation between the studies in terms of population, interventions and outcomes. Characteristics of the trials were presented in tables. However, findings for individual studies were reported without levels of statistical significance and this meant it was not possible to verify the findings reported in the review. Most of the trials were of poor quality.

The authors’ conclusions appear overoptimistic as the overall strength of evidence was moderate for mobility and low for physical functioning. In addition the results are based on a small number of studies. Given these limitations the conclusion may not be reliable.

Implications of the review for practice and research
Practice: The authors did not state any implications for practice.

Research: The authors stated that further research was needed to confirm whether benefits were greater than harms for physical activity interventions for older people with dementia.

Funding
Social Insurance Institution of Finland; the Central Union for the Welfare of the Aged; the Sohlberg Foundation; King Gustaf V and Queen Victoria’s Foundation.

Bibliographic details
Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.