A systematic review of the effects of physical activity on physical functioning, quality of life and depression in older people with dementia

Potter R, Ellard D, Rees K, Thorogood M

CRD summary
This review concluded that there was some evidence that physical activity interventions can improve physical function in older people with dementia but the evidence for depression and quality of life was limited. The results of this generally well-conducted review need a cautious interpretation because of the poor quality and heterogeneity of the available evidence.

Authors' objectives
To assess the effects of physical activity on depression, quality of life and physical functioning in people with dementia.

Searching
MEDLINE, EMBASE, CINAHL, PsycINFO, AMED, Cochrane Central Register of Controlled Trials (CENTRAL), NRR and Current Controlled Trials were searched to February 2009 for studies published in English. Search terms were reported. Reference lists of relevant papers were searched.

Study selection
Controlled trials (randomised or not) that assessed any form of physical activity for a minimum of 12 weeks in people aged 60 or more (or those described as older, seniors and older people) with some form of cognitive impairment or dementia were eligible for inclusion. Participants could be resident in the community, residential care or hospital. Interventions could take place in any setting. Studies had to report on at least one outcome from depression, health related quality of life, physical function and balance (including falls).

The included trials were conducted in North America, Europe, Korea and Israel. Most trials delivered the intervention in the participant's residence; others were given in a community facility, participant's home or sheltered housing complex. Mean age ranged from 73 to 88 years. More participants were female (where reported). Dementia was formally diagnosed in 62% of studies. Baseline physical ability varied between trials. Most interventions included some element of strength, flexibility or balance training and most were delivered for between 12 and 16 weeks. Most trials did not report exercise intensity but of those that did one was low, one was moderate and one had a self-paced intensity. Most trials delivered the intervention to groups of between two and 15 participants. Control groups received a non-active or no-intervention control. Outcomes reported were timed get up and go tests, timed walking tests (including a six-minute walk test), walking speed, balance (Berg balance test), functional reach, flexibility, lower limb strength, depression and quality of life.

Studies were selected by at least two reviewers independently. Disagreements were resolved by discussion.

Assessment of study quality
Study quality was assessed using a nine-item checklist for randomised and non-randomised studies which was adapted from The Cochrane Handbook.

At least two reviewers independently performed the assessment.

Data extraction
Mean changes from baseline with standard deviations were extracted or estimated. Where results for more than one time point were reported the longest follow-up was used.

At least two reviewers independently performed data extraction. Authors were contacted for additional data.

Methods of synthesis
Results were pooled using fixed-effect meta-analysis unless there was significant heterogeneity (measured using the I²
statistic) where a random-effects model was used. Weighted mean differences (WMD) were calculated. Where meta-
analysis was not possible, results were presented in a narrative synthesis. Sensitivity analysis was used to explore the
effect of any studies with outlying results.

Results of the review
Thirteen trials were included (896 participants, range 16 to 191). Six trials had adequate methods of randomisation and
three of these also provided methods of allocation concealment. Eight trials reported losses to follow-up and six used
intention-to-treat analysis. Five trials reported sample size calculations for their primary outcome. Ten trials reported
attrition rates (range from 4% at 12 weeks to 32% at two years).

Timed get up and go tests (five trials): There was a reduction in timed get up and go with the intervention (WMD -1.39
seconds, 95% CI -2.59 to -0.19; three trials) but heterogeneity was very high (I²=96%). When the trial with outlying
result was removed, this result was no longer statistically significant.

Timed walking tests (six trials): Three trials showed a significant increase in walking speed with the intervention, one an
increase in walking distance and one a small but non-significant decrease in walking distance. The results of two trials
that used a six-minute walk test were pooled but no significant difference was found and heterogeneity was high
(I²=85%). Walking speed was pooled for four trials and showed a statistically significant improvement in speed (WMD
0.06 metres per second, 95% CI 0.01 to 0.1; I²=0%).

Balance and functional reach: Seven trials measured balance and one trial measured functional reach. Two trials that
used the Berg balance scale were pooled and found a significant improvement for the intervention (WMD 3.4 points,
95% CI 1.08 to 5.72; I²=0%).

Flexibility and lower limb strength: Two out of three trials that reported flexibility found significant improvements with
the intervention. Three out of four trials that reported lower limb strength found a significant improvement with the
intervention.

Depression and quality of life: Four trials reported depression outcomes, all using a different measure. Three trials did
not find any significant differences. One trial found a significant improvement for a subgroup of patients (58% of the
total sample) at 24 months using the Cornell scale for depression in dementia. Two trials measured quality of life using
a variety of questionnaires. One trial found significant differences in four out of seven measures with higher scores for
comprehensive exercise compared to social conversation. The other trial found improvements in physical role function
at three months.

Authors’ conclusions
There was some evidence that physical activity interventions can improve physical function in older people with
dementia. Evidence for an effect on depression and quality of life was limited

CRD commentary
This review had clear inclusion criteria for study design, interventions, participants and outcomes. The search included
a range of databases and sources of unpublished studies but was limited to studies in English so language bias was a
possibility. Study selection, data extraction and quality assessment were performed by two independent people, which
reduced risks error and bias. Studies were combined using meta-analysis even where heterogeneity was high and the
authors suggested a cautious interpretation of the results.

The results of this generally well-conducted review need a cautious interpretation because of the poor quality and
heterogeneity of the available evidence.

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

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