Physical activity and behaviour in dementia: a review of the literature and implications for psychosocial intervention in primary care

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CRD summary
This review evaluated the effects of planned physical activity programmes on mood, sleep and functional ability in people with dementia. The authors concluded that sustained walking may benefit mood and physical activity appears to benefit sleep quality and functional ability in care-home residents. The conclusions overlook conflicting evidence, while methodological weaknesses make it unclear whether the findings can be relied upon.

Authors' objectives
To evaluate the effects of planned physical activity programmes on mood, sleep and functional ability in people with dementia.

Searching
PubMed, Web of Science, PsycINFO and BioMedCentral were searched up to October 2005; the search terms were provided.

Study selection

Study designs of evaluations included in the review
Experimental designs ranging from randomised controlled trials (RCTs) to uncontrolled before-and-after studies were eligible for inclusion.

Specific interventions included in the review
Studies delivering an intervention with exercise as a primary component were eligible for inclusion. The interventions delivered by the included studies were varied and were of an exercise intervention alone or in combination with other components such as social interaction, sleep hygiene measures, light exposure and relaxation. The exercise components of the interventions included walking, exercise to music and seated exercise; in several studies multiple forms of exercise were used. The intensity and duration of the interventions also varied. Where reported, the interventions were implemented mainly by therapists or researchers, but also by volunteers and carers.

Participants included in the review
Studies of participants with some degree of cognitive impairment, a diagnosis of dementia, or for ambulant nursing home residents a score of less than 23 out of 24 on the Mini-Mental State Examination (MMSE), were eligible for inclusion. In the majority of the included studies the participants were exclusively living in care homes; there were also some studies of people living in their own homes and of mixed populations. Where reported, the mean MMSE score ranged from 7.3 to 23.9 (for intervention or control group or both combined). The comparators included social visits of similar frequency to the exercise intervention, no intervention and an alternative exercise intervention.

Outcomes assessed in the review
Studies assessing behaviour, mood, sleep or functional ability were eligible for inclusion. Details of the specific measures used in the included studies were not provided, but the general outcomes reported included night-time awakening, depression, physical function and activity, mood, group behaviour, walking endurance capacity, mobility, strength and various behavioural problems.

How were decisions on the relevance of primary studies made?
The authors did not state how the papers were selected for the review, or how many reviewers performed the selection.
Assessment of study quality
The studies were classified into three classes based on their methodological characteristics. Class I were RCTs with (a) clearly defined outcome measures, (b) clearly defined inclusion criteria, (c) reporting of drop-outs, which should be low, and (d) equivalent groups at baseline. Class II were RCTs that lacked one of these four criteria or non-randomised controlled studies that met all the criteria. Class III were all other controlled trials. The authors did not state how the validity assessment was performed.

Data extraction
The authors did not state how the data were extracted for the review, or how many reviewers performed the data extraction.

Methods of synthesis
How were the studies combined?
The studies were discussed in a narrative synthesis.

How were differences between studies investigated?
In the narrative synthesis, studies were grouped by the outcome investigated (affective behaviour, sleep and functional ability) and by trial design.

Results of the review
Twenty-seven studies (n=1,160) were included: 6 RCTs (class I), 7 RCTs (class II), 5 controlled studies classified as class III, two of which were randomised, and 9 before-and-after studies.

Affective behaviour (17 studies).
One class I study showed a benefit in levels of agitation in nursing home residents with 5 minutes’ exercise every 2 hours for 5 days per week combined with a night-time programme to aid sleep compared with a sleep programme alone. Another class I study reported reduced depression in community-based Alzheimer's disease patients with a programme involving sleep hygiene and behaviour management advice for the caregiver, daily 30-minute walks for the patient and increased light exposure for 2 months compared with sleep hygiene and behaviour management advice for the carer only. The other 3 class I studies showed no change with the intervention. The remaining class II and III studies showed mixed results. Four of the 5 before-and-after studies reported a positive effect on mood, though not all of these studies reported a statistical analysis.

Sleep (6 studies).
The 3 class I studies that used wrist activity monitors to measure sleep reported increased night-time sleep and reduced night-time awakenings with the exercise intervention. Two of these were the same studies as above (class I studies for affective behaviour), while the third study used a similar intervention to the combination of night-time programme and low-intensity exercise for nursing home residents. The class II study showed no effect, while the class III study and before-and-after study showed a positive benefit.

Functional ability (6 studies).
The only class I study reported a benefit in functional balance and activities of daily living with an exercise activity involving seated strength and range of motion exercises for 1 hour, 3 times a week for 6 months compared with recreational therapy. The remaining studies showed inconsistent results.

Authors’ conclusions
The authors drew separate conclusions for each of the outcomes. Sustained walking in particular may benefit mood. Physical activity appears to have a beneficial impact on the quality of sleep and may also have positive effects on functional ability in care-home residents, but only when a long-lasting programme is applied.
CRD commentary
The review question was clear. Although the criteria were broad this was appropriate; consequently, however, the included studies were diverse and the only sources of diversity considered in the narrative synthesis were study design and where the participants lived. Some relevant databases were searched but specific attempts to locate unpublished studies were not made and it was unclear whether any language restrictions were applied, thus there is a risk of publication and language bias. The method used to assess methodological quality was not a sensitive one and important aspects of quality, such as concealment of allocation, were not considered. There is a risk of error and bias in the review as the study selection data, data extraction and quality assessment processes do not appear to have been checked or carried out in duplicate.

Relevant details on the participants and the interventions were provided, although these were lacking in aspects concerning outcome measures. In addition, it was difficult to verify the findings as information on the individual study results was very limited; for example, it was unclear whether results reported as positive benefits were statistically significant. The authors' conclusions are reasonably tentative, which is appropriate given the conflicting evidence, though arguably the authors do not draw enough attention to the nature of this evidence. The recommendations for practice were too definitive given the limited evidence on which they were based.

Implications of the review for practice and research
Practice: Exercise programmes should include a walking activity and take at least 30 minutes in order to benefit mood; to have a beneficial impact on sleep they should be offered frequently during the week, irrespective of duration; and care-home residents need a long-term exercise programme with extensive sessions to achieve a positive impact on activities of daily living.

Research: Further research into the effects of physical activity and exercise on the subjective experience of carers, maintenance of care at home, and the economical burden of dementia, is required.

Bibliographic details

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Subject indexing assigned by CRD

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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.