
Does the 'Otago exercise programme' reduce mortality and falls in older adults? A systematic review and meta-analysis

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CRD summary

This review concluded that the Otago exercise programme significantly reduced risks of death and falling in older community-dwelling adults. These conclusions reflected the evidence presented. The limited sample sizes of the included studies and concerns about the review methods mean that caution might be required in interpreting these conclusions.

Authors' objectives

To assess the effectiveness of the Otago exercise programme on risk of death and fall rates and to explore the levels of compliance with the Otago exercise programme in older adults.

Searching

MEDLINE, Cochrane Central Register of Controlled Trials (CENTRAL), CINAHL, TRIP and AARP Ageline were searched from 1990 to August/September 2008 without language restrictions. INFORMIT was searched from 1970 to 2008. Australian Digital Theses Program, Physiotherapy Evidence Database, Prevention of Falls Network Europe website and Web of Science were searched up to September 2008. Conference proceedings and reference lists of relevant publications were searched. Study authors were contacted for any additional studies.

Study selection

Randomised controlled trials (RCTs) or controlled clinical trials with blinded assessment of outcomes that compared Otago exercise programme with controls (including social visits) in older adults aged ≥ 65 were eligible for inclusion. The Otago exercise programme was defined as a tailored strength and balance retraining home-based programme in which resistance to lower limb muscles was provided through ankle cuff weights; the programme was carried out at least three times per week. Eligible outcomes were risk of death, falls, fall injuries and compliance to the exercise programme at 12 months.

The mean age of included community-dwelling ambulant participants was 81.6 years. Follow-up duration ranged from six to 12 months. All included trials used the same definition for fall. The included studies were published between 1997 to 2008. Control interventions were usual care or social visits.

Two reviewers assessed studies for inclusion. Any disagreements were resolved by discussion with a third reviewer.

Assessment of study quality

Study quality was assessed with the 11-point PEDro appraisal tool to a maximum score of 10.

Two reviewers performed validity assessment. Any disagreements were resolved by discussion.

Data extraction

Data were extracted on event rates to enable calculation of relative risks (RRs) with 95% confidence intervals (CIs). Where necessary, study authors were contacted for additional information.

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

Methods of synthesis

The studies were combined in a meta-analysis. Pooled relative risks with 95% CIs were calculated using a fixed-effect model. Statistical heterogeneity was assessed using I^2 and X^2 .

Results of the review

Seven trials (five RCTs and two controlled clinical trials) were included (n=1,503). One was an unpublished thesis. Sample sizes ranged from 59 to 450. PEDro scores ranged from 4 to 8.

Compared with controls, Otago exercise programme was significantly associated with a reduction in the risk of death over 12 months (RR 0.45, 95% CI 0.25 to 0.80; seven trials) and fall rates (RR 0.68, 95% CI 0.56 to 0.79; six trials). There was no significant difference in the risk of a serious or moderate injury occurring as the result of a fall between the two groups. No significant heterogeneity was observed in these outcomes.

Only 36.7% of participants in the Otago programme group who remained in the studies at 12 months were still exercising at least three times per week.

Authors' conclusions

Otago exercise programme significantly reduced the risk of death and falling in older community-dwelling adults.

CRD commentary

This review's inclusion criteria were clear. Several relevant databases were searched. Efforts were made to find published and unpublished studies and there were no language restrictions; these minimised potential for language and publication biases. Steps were taken to minimise reviewer bias and errors in study selection and validity assessment; it was unclear whether data extraction was also performed in duplicate. Appropriate criteria were used to assess study quality. Most included studies were moderate to high quality. Most (six out of seven) of the included studies were predominantly conducted by the same group of researchers and this may have weakened the robustness of review findings. Statistical heterogeneity was assessed. Pooling of results from studies with different study designs might not have been appropriate.

The authors' conclusions reflected the evidence presented. The limited sample sizes of the included studies and concerns about the review methods mean that caution might be required in interpreting these conclusions.

Implications of the review for practice and research

Practice: The authors did not state any implications for practice.

Research: The authors stated that future studies should include mortality as an outcome when assessing the effectiveness of the Otago exercise programme in older adults.

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