

Cochrane Corner



Are multifactorial and multiple component interventions effective in preventing falls in older people living in the community?

A Cochrane Review summary with commentary

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Keywords: Falls, Exercise, Rehabilitation , Elderly, Cochrane Review Summary

The aim of this commentary is to discuss, from a rehabilitation perspective, the recently published Cochrane Review “Multifactorial and multiple component interventions for preventing falls in older people living in the community” by Hopewell et al.¹. This review was produced with the support of the Cochrane Bone, Joint and Muscle Trauma Group. This Cochrane Corner is produced in agreement with Journal of Musculoskeletal and Neuronal Interactions by Cochrane Rehabilitation.

Background

Falls are defined as an unexpected event in which the individual comes to rest on the floor, ground, or lower level². Around one third of people over 65 who live in the community are at risk of falling at least once a year, with fracture or major injuries in 10% of cases³. Falls and their consequences may result in disability, institutionalization³, and mortality⁴ in the elderly. Therefore, prevention of falls is critical to prevent further disability and to maintain the independence of older people^{5,6}.

Many interventions have been recommended to prevent

falls. Single component interventions include exercises, targeted drugs and medication review, education, use of assistive-technology, home safety, psychological and surgical interventions⁷. Fall prevention interventions may involve combinations of two or more different types of intervention (e.g. exercise and home safety). Such interventions are either multifactorial or multiple component interventions.

The long-term disability and mortality due to falls and fall-related injuries, with related high costs for the society, highlight the need to identify the most effective interventions for the prevention of falls. A Cochrane Review (Hopewell et al., 2018)¹ provides important evidence regarding the effectiveness of these interventions for people living in the community.

Multifactorial and multiple component interventions for preventing falls in older people living in the community (Hopewell et al., 2018)¹

What is the aim of the Cochrane review?

The aim of this Cochrane Review was to evaluate the possible benefits and harms of multifactorial interventions

The author declares no conflicts of interest.

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¹ The abstract/plain language summary of this Cochrane Review is taken from a Cochrane Review previously published in the Cochrane Database of Systematic Reviews 2018. Issue 7. CD011221. DOI:10.1002/14651858.CD011221.pub2. (see www.cochrane.library.com for information). Cochrane Reviews are regularly updated as new evidence emerges and in response to feedback and Cochrane Database of Systematic Reviews should be consulted for the most recent version of the review.

and multiple component interventions for preventing falls in older people living in the community.

What was studied in the Cochrane Review?

The population studied in the Cochrane Review was older people (ages ranging from 62 to 85 years, median of 77 years) living in the community (a total of 19,935 participants) from 62 randomized controlled trials (44 studying multifactorial and 18 studying multiple component interventions). The main inclusion criterion was the presence of participants aged 60 years or over, recruited as living in the community (at home or residences, not using residential health-related care or rehabilitative services). The review excluded trials focussing on people with long-term chronic disease (e.g. stroke, Parkinson's disease, etc.).

Interventions studied were multifactorial and multiple component interventions. Interventions were considered multifactorial when two or more categories of intervention were in relation with the individual's risk profile assessed using a formal process⁸. Most of these interventions included the application of supervised or unsupervised targeted exercises, modification of the environment of person's daily living, or the use of assistive technologies aiding to mobility, communication, personal care and protection, or the medication review. Also psychological interventions were frequently applied. Multiple component interventions were considered when two or more categories of intervention were performed in a generic falls prevention programme⁸. All of the trials except one included exercise as the main active component, variably associated with education, generic advice on home safety, nutrition and psychological counseling. As control interventions, trials included attention control or socio-educational interventions or the maintenance of the usual activity (inactive control group) or with specific exercise, mostly directed to gait or balance, as fall prevention (active control group). The main outcomes were the rate of falls (number of falls per person-years), the risk of falling (number of people with one or more falls) and the risk of recurrent falls (two or more falls in a specified time period). Secondary outcomes were the presence of fall-related fractures, the need for medical attention or hospital admission due to falls, health-related quality of life (HRQoL) and adverse effects of the intervention.

How up-to-date is this review?

The authors have extended the results of a previous Cochrane Review published in 2012⁷ updating to 12 June 2017.

What are the main results of the review?

The main results for multifactorial interventions are:
When compared with usual care or attention control (43 studies):

- some evidence of reduction in the rate of falls (low quality of evidence),

- little or no difference for the risk of falling, risk of recurrent falls, risk of hospital admission and medical attention (low quality evidence),
- possible reduction in the risk of fractures related to falls and slight improvement in people's reported HRQoL results that may not equate to a minimal clinically-important difference in the SF-36 (low quality evidence),
- no adverse events reported in 1 study and reported self-limiting musculoskeletal complaints in 2 studies (12 participants), probably related to exercise programme.

When compared with exercise (1 study)

- very low-quality evidence on the rate of falls or the risk of falling.

The main results for multiple component interventions are:
When compared with usual care or attention control (17 studies):

- probable reduction of the rate of falls and the risk of falling (moderate-quality evidence),
- possible reduction on the risk of recurrent falls (low-quality evidence),
- uncertain effect on the risk of fractures related to falls (very low quality evidence),
- little or no difference for the risk of medical attention requirement,
- a slight improvement on HRQoL with clinically-important difference at SF-36 (low-quality evidence),
- no adverse events reported in 5 studies, while resolvable minor adverse events (principally joint pain) in 6 participants reported in 2 studies.

When compared with exercise (5 studies):

- little or no difference in the rate of fall and the risk of falling (low quality evidence) and an uncertain effect on hospital admission (very low-quality evidence),
- adverse events reported in only 1 study with 2 individuals suffering from minor joint pain.

Most of the trials were judged at unclear or high risk of bias.

How did the authors conclude on the evidence?

Hopewell and colleagues (at Universities of Oxford, UK and Sydney, Australia) noted that multifactorial interventions could be effective in reducing the rate of falls (low quality of evidence) when compared with inactive controls. For the other fall-related outcomes such as risk of falls, recurrent falls, fractures, hospital admission or medical attention related to falls, these types of interventions seemed to have a little or no effect. Their effect on HRQoL of life was noted to be little. Multiple component interventions, with exercise as main part of the programme, seemed to be effective in reducing the rate of falls and the risk of falling (moderate quality of evidence) and in improving slightly the quality of life when compared with inactive controls. This efficacy on the rate of falls and the risk of falling is not evident (little or no difference) when multiple component interventions are compared with exercise interventions only. They may also reduce the risk of recurrent falls, but there was not enough evidence to conclude on other falls-related measures.

Recommendations for research by the authors of the Cochrane Review (Hopewell et al.)¹

The authors suggested a focus on whether there are additional benefits of other components of interventions over exercise alone both for the clinical outcomes and health economic data. In particular, they propose using exercise as an active comparator rather than inactive control groups. They also highlight the importance of measuring adherence to interventions and research examining the impact of adherence on effectiveness of these interventions. Finally, the authors focus on the quality of studies, especially for the amelioration of the methodological biases (blinding of the received treatment by carers, presence of more objective tools for reporting falls, use of a unique definition of the measured outcomes).

What are the implications of the Cochrane evidence for practice in rehabilitation?

From a rehabilitation perspective, the prevention of falls is very important due to its consequences resulting in disability with activity limitations and participation restrictions^{5,6}. Falls may lead to additional impairments in functioning in ageing persons who may already be suffering from problems due to ageing⁹.

Exercise, the key element in these interventions, seems effective independently of the person's risk profile. Exercise programmes for older people could be a starting point to focus the attention of rehabilitation professionals on type, intensity and frequency of exercise in the general population both for the clinical practice and research. The use of co-interventions as proposed in the trials could improve the efficacy of this physical activity. These programmes could be also useful, both as fall prevention programmes for the community-dwelling elderly, and also for patients with orthopedic and neurological diseases return home from the hospital. Regardless of the type of intervention, all people could benefit from exercise programmes plus co-interventions carried out continuously, both in the short and long period. The low quality evidence on certain fall outcomes which has high likelihood of changing in further research warrants future robust studies to reveal more definitive evidence.

Acknowledgements

The author thanks Frane Grubišić from Cochrane Rehabilitation and Joanne Elliott and Helen Handoll from the Cochrane Bone, Joint and Muscle Trauma Group for reviewing the contents of the Cochrane Corner.

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