

Fall Prevention in Community-Dwelling Older Adults

Clinical Question Which types of interventions reduce falls in older people living in the community?

Bottom Line Fall-prevention exercise programs, usually including muscle strengthening and balance retraining, were associated with lower fall rates in community-dwelling older people whether or not individuals were selected on the basis of fall risk. Home safety interventions, vitamin D supplementation in people with lower vitamin D levels, and individually targeted multifactorial interventions were associated with fewer falls in community-dwelling people with risk factors for falling.

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APPROXIMATELY 30% OF OLDER community-dwelling people fall each year. Falls can result in adverse outcomes including hip fracture, fear of future falls, and nursing home admission.^{1,2} This JAMA Clinical Evidence Synopsis summarizes a recent Cochrane systematic review of 159 randomized controlled trials testing interventions to reduce the incidence of falls in community-dwelling older people.³

SUMMARY OF FINDINGS

Pooled results from trials testing similar interventions (classified using the ProFaNE taxonomy⁴) showed a significant reduction in falls from several types of interventions (FIGURE).

Participants randomized to group and home-based exercise programs with multiple components including muscle strengthening and balance retraining had fewer falls than control groups (rate ratio, 0.71 [95% CI, 0.63-0.82] and rate ratio, 0.68 [95% CI, 0.58-0.80], respec-

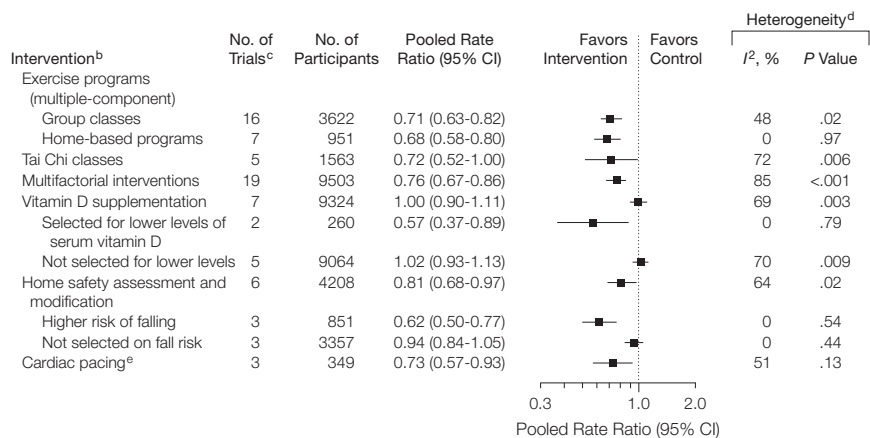
tively). Tai Chi classes were associated with a lower rate of falling. Pooled data from 6 studies demonstrated that an exercise program was associated with a lower risk of a fall-related fracture.

Individually targeted multifactorial interventions were associated with reduced fall rates (rate ratio, 0.76 [95% CI,

0.67-0.86]). Multifactorial interventions are complex, usually require a multidisciplinary team, and include various types of assessments, treatment combinations, and referral processes.

Overall, vitamin D supplementation was not associated with lower fall rates in older community-dwelling

Figure. Rate Ratios (All Falls) for Selected Fall-Prevention Interventions vs Control in Community-Dwelling Older People^a



^aBased on data from Gillespie LD, Robertson MC, Gillespie WJ, et al. Interventions for preventing falls in older people living in the community. *Cochrane Database Sys Rev.* 2012;(9):CD007146. doi:10.1002/14651858.CD007146.pub3. Absolute numbers for analyses are not provided because the absolute number of falls in each group was not always available. For these analyses, the "absolute number" was a rate of falls, eg, falls per person-year, or in some cases a reported rate ratio.

^bControl groups received no intervention, usual care, or an intervention that was not expected to reduce falls, eg, social visits.

^cThe number of trials does not add to 159 because not all of the trials evaluated in the Cochrane review are summarized here.

^dVariation across the results from individual studies due to clinical and/or statistical diversity. A P value <.10 represents a statistically significant variation. I² measures the variation in results between studies that is due to heterogeneity rather than sampling error (chance) (range, 0%-100%).

^eFor people with carotid sinus hypersensitivity and history of syncope and/or falls.

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Evidence Profile

No. of randomized trials: 159

Study years: 1990-2011

No. of participants: 79 193

Men: 23 758 (30%) Women: 55 435 (70%)

Race/ethnicity: Unavailable

Age, mean (range): 75 (51-101) years

Setting: Community

Countries: Australia, Austria, Belgium, Brazil, Canada, Chile, China, Denmark, Finland, France, Germany, Italy, Japan, the Netherlands, New Zealand, Norway, Sweden, Switzerland, Taiwan, Thailand, United Kingdom, United States

Comparison: Intervention to prevent falls vs control group

Primary outcomes: Rate of falls; number of fallers

Secondary outcomes: No. of participants sustaining fall-related fractures

people (rate ratio, 1.00 [95% CI, 0.90-1.11]). However, 2 trials demonstrated that vitamin D supplements were associated with lower fall rates in people with lower vitamin D levels.

Home safety interventions were associated with a reduced rate of falls (rate ratio, 0.81 [95% CI, 0.68-0.97]). These interventions were more effective in people at higher risk of falling and when delivered by an occupational therapist.

Cardiac pacing in people with carotid sinus hypersensitivity and a history of syncope and/or falls was associated with lower fall rates.

Expedited cataract surgery was associated with a lower fall rate compared with remaining on a waiting list for 12 months (rate ratio, 0.66 [95% CI, 0.45-0.95]; 1 trial, 306 participants). However, an intervention that combined assessment by an optometrist with provision of new eyeglasses, a home visit with an occupational thera-

pist, glaucoma management, or cataract surgery if indicated was associated with an increase in fall rates (rate ratio, 1.57 [95% CI, 1.19-2.06]).

Gradual withdrawal of psychotropic medications (rate ratio, 0.34 [95% CI, 0.16-0.73]; 1 trial, 93 participants) and an educational program for primary care physicians and their patients to improve medication prescribing practices (risk ratio, 0.61 [95% CI, 0.41-0.91]; 1 trial, 659 participants) were associated with a lower rate of falls and risk of falling, respectively.

One study showed a lower rate of falls in people with disabling foot pain who received customized orthotics, footwear review, foot and ankle exercises, and fall prevention education in addition to usual podiatry care (rate ratio, 0.64 [95% CI, 0.45-0.91]; 305 participants).

There is no evidence of benefit for cognitive behavioral interventions. Evidence for interventions that provide educational materials alone is inconclusive.

COMMENT

Fall-prevention exercise programs, home safety interventions, vitamin D supplementation in people with lower vitamin D levels, and individually targeted multifactorial interventions were associated with lower fall rates in community-dwelling people.

Limitations

Results reported here may not apply to people with dementia because they were specifically excluded from the majority of studies. We excluded trials recruiting individuals after stroke and trials of those with Parkinson disease. Some pooled results show statistically significant heterogeneity between included studies (Figure). Pooled data from studies with significant heterogeneity require cautious interpretation because it indicates the possibility of meaningful differences between these studies.

Comparison of Findings With Current Practice Guidelines

Our findings agree with the recommendations on exercise in the recent US Preventive Services Task Force guidelines,⁵ but the updated American Geriatrics Society/British Geriatrics Society guideline only recommends a multifactorial approach to fall prevention.⁶ Our review included trials published since both of these guidelines were developed.

Areas in Need of Future Study

Additional studies are needed to address methods to increase implementation of effective interventions by health care professionals.

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