

SYNOPSIS

“Economic Evaluations of Falls Prevention Programs for Older Adults: A Systematic Review”

Citation: Olij BF, Ophuis RH, Polinder S, van Beeck EF, Burdorf A, Panneman MJM, et al. Economic evaluations of falls prevention programs for older adults: a systematic review. *J Am Geriatr Soc.* 2018; 66(11):2197-204. Available from: <https://onlinelibrary.wiley.com/doi/pdf/10.1111/jgs.15578>

Synopses are brief descriptions of original research articles and reviews, such as those that appear in the published and grey scientific literature. Synopses summarize and critique single studies or reviews and cannot be assumed to represent the body of evidence on a specific topic.

Key Messages

- Falls represent the leading preventable injury in older adults in Ontario. Falls prevention is a topic of consideration for public health units to address in the Ontario Public Health Standards.
- There is a breadth of literature that examines the effectiveness of falls prevention programs in the older adult population; however, the costs associated with implementing these programs are a key consideration in public health planning.
- The results of this review by Olij et al. suggest that the most cost-effective programs for falls prevention include medication adjustment programs for older adults living in long-term care facilities and home assessment programs for those living in the community. Exercise interventions are also considered cost effective when including a higher willingness to pay threshold. The evidence was mixed for multifactorial programs.
- This review used a validated tool for reporting and appraising included studies, a standardized method to calculate incremental cost-effectiveness ratios (ICERs) and reported results by population group. Some limitations included methodological differences across included studies that limited the ability to compare program types directly, a lack of reporting of operational definitions of falls in each study, as well as the need for greater transparency in the type of control programs that were used as comparisons.

Background

- Falls is the leading cause of morbidity in older adults in Ontario^{1,2} and represents a significant cost both economically and personally.³ In 2017, there were over 140,000 injuries reported to Ontario emergency rooms due to falls in older adults ages 65 years and older.⁴

- There is a breadth of evidence to support interventions to reduce falls in both community-dwelling older adults, as well as those in long-term care facilities;⁵ however, the rate of fall-related injury in older adults remains high.
- The cost of implementing interventions to prevent falls is an important consideration in decision making for public health. Economic evaluations provide analyses on the relative cost of implementing an intervention in relation to a comparator using the Incremental Cost-Effectiveness Ratio (ICER), which is a ratio of the incremental cost (cost of intervention A – cost of intervention B) and the incremental effect (effectiveness of intervention A – effectiveness of intervention B).⁶ Cost-effectiveness is presented as an ICER either under or over a willingness to pay threshold. In the literature, there are two common willingness to pay thresholds - \$50,000 and \$100,000. Given the \$50,000 threshold as a lower boundary has been in use since the 1980s, \$100,000 is a more commonly used threshold that adjusts for inflation.⁷

Appraisal

Critical appraisal of this review was conducted using guidelines for conducting and reporting economic evaluations of fall prevention strategies, by Davis et al.⁸ This review was also rated high in quality (9/10) using the Health Evidence™ critical appraisal tool.⁹

Study Design

Systematic review

Main Findings

A total of 31 economic evaluations of falls prevention programs were included in this review. Of the interventions found, 25 evaluated falls prevention programs in the context of community-dwelling older adults, three in long-term care facilities and three interventions that served both populations. Overall, the majority of identified interventions that reported ICERs with quality adjusted life years (QALYs) as the outcome were below the defined lower willingness to pay threshold of \$50,000 per QALY. Specifically, economic evaluation of home assessment programs (n=6) for community-dwelling older adults and those that support the revision of medications for those in long-term care facilities (n=4) reported ICERs under the lower willingness to pay threshold. The results for mixed populations (i.e., community dwelling and those in long-term care facilities) demonstrated inconsistent results; however, with higher willingness to pay thresholds (\$100,000 per QALY), exercise interventions (n=9) were also cost effective. Multifactorial programs (n=11) and other programs (n=13) demonstrated mixed results.

Strengths

There were several strengths to this review. First, a validated checklist (Consensus Health Economic Criteria - CHEC) was used for reporting and appraising the included articles, as well as a standardized method to conduct the calculation of ICER. The authors converted all costs to 2016 US dollars to increase comparison across studies. The authors also reported results by population group – long-term care and community-dwelling residents. This is an important consideration, as the associated costs and context of implementation of falls prevention programs is different by population.⁸ Further, the age of those living in care settings differs from those in other settings; (i.e., over 50% of older adults that reside in long-term care facilities are over the age of 85).¹⁰ The population under study (i.e., those of high risk of falls) is important to consider, as baseline fall risk is an important determinant of cost effectiveness.⁸

Limitations

This study reports some limitations in conducting and reporting this work. First, the authors report that the methodological differences between studies included in the review limited the ability to compare program types directly. In addition, the majority of the trial-based studies were powered to detect differences in the number of falls, not the costs associated with preventing a fall. This may distort the results, given the skewed distribution of a cost-related outcome.¹¹ Finally, the cost effectiveness of a program is dependent on the willingness to pay threshold value used. In this review, a lower (\$50,000) and higher (\$100,000) threshold value was used and reported, per QALY. The cost of each program should be considered with both lower and upper threshold values,¹² given that there is no fixed value for cost per QALY to determine what is cost effective.⁶ With low willingness to pay thresholds, programs may be considered not cost effective and vice versa, if the threshold is too high. For example, if the threshold was lowered to \$20,000, the majority of interventions in this study would not be cost effective.¹¹

In addition to the limitations reported in this study, there are other limitations to consider. Olij et al. did not state the limitation of authors that did not report the comparison intervention. Davis et al. recommends authors report what the comparison intervention is, particularly when a control program or no program is used as the comparator. Comparing interventions to usual care places the results of the economic evaluation in a real world context, in addition to increasing the ability to report values across studies.⁸ Eleven of the 31 studies included in this systematic review were compared to “control programs” with no clear definition or to no program at all. In this case, the reported ICERs would be lower compared to studies that used alternative interventions as the comparison group.

Other limitations included not accounting for: the person-time at risk; differences in sample sizes; how the studies treated missing data; and differential losses to follow-up. These factors all potentially bias the ICERs and could have been reported as a limitation of the included studies. In addition, there is a limitation in studies not operationally defining falls. Studies should report whether they included all injurious falls, including those that caused a traumatic brain injury over falls causing fracture alone. Finally, there is variation in the quality of the tools used to calculate QALYs and these variations should be reported for each study. For example, studies that used the EQ-5D (EQ – 5D is a standardized tool used to measure health-related quality of life) should report the tools limitations, for example, EQ-5D lacks sensitivity to detect small changes in health status and authors can run into analytical problems when there are outliers in the data set.⁸ Davis et al. recommend the use of a tool where the key domains are responsive to the population-specific outcomes expected from the intervention.

Reliability

The authors of this study report no conflicts of interest and report the results of this review in a high impact journal (JAGS) (Impact Factor: 4.388 in 2016) with readership including a diverse, multi-sectorial community of practice. The authors of this review are public health researchers and the senior author’s area of research is in older adults and falls prevention.

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