The cost-effectiveness of home assessment and modification to reduce falls in the elderly

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Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

Health technology
Fall prevention programmes for the elderly.

Type of intervention
Primary prevention.

Economic study type
Cost-effectiveness analysis.

Study population
Elderly people aged 75 years or older, living independently in the community.

Setting
Community setting. The study used Australian data where possible.

Dates to which data relate
The effectiveness data were retrieved from studies previously published between 1982 and 1996. The cost data were retrieved from studies previously published in 1996. The price year was 1996.

Source of effectiveness data
Effectiveness data were derived from a review of previously published studies and estimates based on expert opinion.

Modelling
A decision analytic model (Markov model) was developed to simulate the potential costs and outcomes of the intervention, versus no intervention, over one and 10-year periods.

Outcomes assessed in the review
The outcomes assessed included the fall rate, the injury rate after a fall, the type of injury, and the treatment for injured elderly.

Study designs and other criteria for inclusion in the review
Not stated.

Sources searched to identify primary studies
NHS Economic Evaluation Database (NHS EED)
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Criteria used to ensure the validity of primary studies
Not stated.

Methods used to judge relevance and validity, and for extracting data
Not stated.

Number of primary studies included
Approximately 6 studies were included in the review.

Methods of combining primary studies
Not stated.

Investigation of differences between primary studies
Not stated.

Results of the review
The fall rate and the injury rate after a fall were assumed to be 0.4 and 0.1, respectively. The percentage of injured patients hospitalised, non-hospitalised, and left untreated was 17%, 77%, and 6%, respectively. 9 different types of injuries were included, with probabilities ranging from 0.01 to 0.83. The percentage of patients who died, were rehabilitated, went to a nursing home or went back home after neck of femur injury was 17%, 23%, 22%, and 38%. These data formed part of the input parameters to the model.

Methods used to derive estimates of effectiveness
Estimates of effectiveness were also derived from expert opinion. The advice of an occupational therapist and a specialist in falls in the elderly was sought.

Estimates of effectiveness and key assumptions
The intervention was assumed to reduce the fall rate over any one-year period by 25%. It was assumed that falls would occur half way through the year and patients would be taken to a hospital casualty department. All hospitalised patients would be discharged to home. These data also formed part of the input parameters to the model.

Measure of benefits used in the economic analysis
The measures of benefit were the number of falls prevented and number of injuries prevented. However, since the authors made assumptions about the fall rate and the injury rate after a fall, the cost implications of the intervention were examined.

Direct costs
Discounting for the 10-year analysis was at 5%, with 0% and 10% used in sensitivity analysis. Quantities and costs were reported separately. The direct costs estimate included assessment costs, costs related to the provision of aids, nursing home costs, rehabilitation costs, home help costs, and costs of the ambulance service. The quantity/cost boundary adopted was that of the health service. The estimation of quantities and costs was based on previously published studies and expert opinion. Cost estimates were obtained from the occupational therapist, a study previously published in 1996 and the 1995 Victorian Inpatient Cost Weights Study database. The price year was 1996.
Statistical analysis of costs
Not reported.

Indirect Costs
Not included.

Currency
Australian dollars (Aus$).

Sensitivity analysis
Sensitivity analysis was carried out on the fall probability, the injury rate from fall, the effectiveness of the intervention, the proportion requiring aids, and the discount rate.

Estimated benefits used in the economic analysis
The estimated benefits were not explicitly given. The authors reported benefits in the synthesis of costs and benefits reported below.

Cost results
The costs of assessment and of providing aids were Aus$70 and Aus$120, respectively. The cost of a nursing home was assumed to be Aus$70.71/day. Rehabilitation costs and costs of home help were Aus$7,454 and Aus$69.96, respectively. Costs related to the ambulance service were assumed to be Aus$247/service.

Synthesis of costs and benefits
Using a one-year time horizon, the incremental cost of introducing the intervention was Aus$172.08 per person. The incremental cost per fall prevented was Aus$1,720.8, and Aus$17,208 per injury prevented. Using a ten-year time horizon, the incremental saving per fall prevented was Aus$915.71 and the saving per injury prevented was Aus$9,157.09. Over a one-year period, there was a substantially less than proportionate change in cost and cost-effectiveness, compared with the proportionate change in the variable of interest. The results of the ten-year analysis were more sensitive, but the intervention still generated cost savings, except where its effectiveness fell to 10%.

Authors’ conclusions
This analysis indicated that there is potential for considerable benefit to be gained from this intervention, in terms of lower morbidity, fewer hospitalisations and, possibly, improved quality of life.

CRD COMMENTARY - Selection of comparators
The rationale for the choice of the comparator was clear.

Validity of estimate of measure of benefit
It was assumed that the fall rate and the injury rate after a fall were constant over the one-year and the ten-year period. However, this assumption was relaxed in the sensitivity analysis where the effectiveness of the intervention was varied. The authors only examined intermediate health outcome measures. No data were gathered or assumptions made regarding final outcomes of mortality and quality of life.

Validity of estimate of costs
Only direct costs falling to the health service were included. No sensitivity analysis of the costs was carried out in order to test the robustness of the results.
Other issues
Because the cost and effectiveness results are based on a model constructed from various data sources and assumptions, questions can be raised about the validity of the results, and their generalisability to a particular setting or country. However, the results did not change significantly when an extensive sensitivity analysis was undertaken.

Implications of the study
Although these results are indicative, further research is required to provide firm data before definitive policy conclusions and recommendations can be made.

Source of funding
None stated.

Bibliographic details

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9659769

Other publications of related interest


Indexing Status
Subject indexing assigned by NLM

MeSH
Accidental Falls /economics /prevention & control /statistics & numerical data; Accidents, Home /economics /prevention & control /statistics & numerical data; Age Factors; Aged; Aged, 80 and over; Australia; Cost-Benefit Analysis; Environment Design; Female; Humans; Male; Models, Economic; Occupational Therapy /economics; Probability; Program Evaluation; Risk Factors; Safety

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