

Effectiveness of falls prevention interventions for older adults newly discharged from hospital: a systematic review protocol

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Review objective: The objective of this review is to synthesize the best available evidence on the effectiveness of falls prevention interventions provided just prior or immediately after discharge from hospital on falls rates and falls injuries among older adults living in the community in the first 6 months after discharge from hospital.

Keywords accidental falls; falls prevention interventions; hospital discharge; older adults

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Background

According to the World Health Organization (WHO), falls among older people are a major global public health challenge.¹ Falls are the second leading cause of unintentional injury and death after road traffic injuries, with an estimated 424,000 fatal falls occurring each year throughout the world.¹ In 2011–2012 in Australia, 96,385 people aged 65 and over were hospitalized for a fall-related injury.² Overall one in every ten days spent in hospital by a person aged 65 and older in 2009–2010 was directly attributable to an injurious fall (1.3 million patient days over the year).²

Hospitalization in older adults, including those who are admitted for medical problems, rehabilitation and acute care, has been shown to be associated with clinically relevant decline in function and

mobility.^{3,4} It is well documented that a significant proportion of older people are admitted to hospital with baseline vulnerability, which results in complicated admissions and long-term adverse hospitalization outcomes, including institutionalization and readmission.^{5–7} Injury or illness requiring hospitalization is an external stressor that initiates a cycle of decline that is observable in frailty scores at six months and one year after discharge.^{8,9} The period after discharge has also been shown to be associated with adverse events, including falls, social problems and medication errors, with up to 30% of older people experiencing an adverse event following hospital discharge.¹⁰ One study investigating falls and fall injuries found an increase in falls among older people in the post-hospital discharge setting compared with older people in the broader community population.¹¹ Other studies have found that between 29 and 45% of older people fall in the period following discharge from medical, surgical and rehabilitation wards.^{12,13} One study examining the

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incidence of falls in older, recently hospitalized medical patients requiring post-discharge home care, found that falls were substantially increased during the first month after hospital discharge.¹⁰

A large number of interventions designed to provide discharge support for older people have been evaluated for their effectiveness for reducing adverse events, including falls following hospital discharge.^{14,15} Systematic reviews have found that there is only limited evidence that discharge interventions encompassing planning and social support have a positive impact on the physical status of patients after discharge.^{16,17} A recent systematic review also concluded that a structured discharge plan tailored to the individual patient may bring about a reduction in hospital length of stay and readmission rates and an increase in patient satisfaction, but the impact on health outcomes was uncertain.¹⁶ Interventions that specifically target falls prevention in the post-hospital discharge setting also show mixed results. For example, a large randomized controlled trial (RCT) found that providing home exercises to older people living in the community who had recently been discharged from hospital improved participants' mobility, but increased the incidence of falls.¹⁷ An RCT that evaluated providing hospital patients with tailored falls prevention education demonstrated that the intervention reduced in-patient falls, but had no ongoing effect in the post-discharge period.¹¹ In a factorial design study, combination interventions of extended physiotherapy reduced falls but not hospital admissions; though when high-dose cholecalciferol treatment was introduced, hospital admissions, but not falls rates, were reduced.¹⁸ In post-discharge populations, one systematic review synthesized the evidence for the efficacy of education interventions for reducing falls in hospital and post-discharge settings.¹⁹ This review suggested that education was an effective means of reducing falls and falls injuries in the hospital in-patient and post-hospital setting. However, other falls prevention interventions were not examined in this review unless provided in combination with education.

Large systematic reviews have been conducted to establish the evidence for effective falls interventions in the general community.²⁰⁻²⁵ For example, multiple systematic reviews have concluded there is an established evidence that exercise interventions, which contain a balance and strength component,

can reduce both the risk and rate of falls.²³⁻²⁵ This included a large systematic review of 159 RCTs (79,193 participants), which examined the effectiveness of interventions designed to reduce the incidence of falls for older people in the community.²⁴ However, these reviews did not specifically address the evidence for interventions evaluated in the post-discharge setting. In comparison, the lack of systematic evidence for the effectiveness of falls prevention interventions in the post-discharge setting shows there is a potential gap in evidence for guiding clinical care during the hospital-to-home transition period. This potentially impacts on older people who are vulnerable to falls, functional decline and readmission during this period.

A preliminary search of the literature in the *JBI Database of Systematics Reviews and Implementation Reports*, Cochrane Library, PubMed, CINAHL and PROSPERO found no recent systematic reviews either published or underway on the effectiveness of falls prevention interventions for the older population in the post-hospital discharge setting. The absence of synthesized best available evidence for single and multiple component falls interventions for older people in the post-discharge setting justifies this current review. The timing for this current systematic review is appropriate given the implications for clinical practice, as older people being discharged from hospital are at a higher risk of falls. It is important to summarize the best available evidence for falls prevention interventions that could be used for older people during the post-discharge period, and to also identify what further research regarding falls prevention is required to be undertaken in this population.

Inclusion criteria

Types of participants

The review will consider studies that include people aged 60 years of age or older; studies where there are people who are less than 60 years will be included if the mean age of the group is over 60. Studies with older people who have been hospitalized in acute or rehabilitation wards and discharged to the community setting will be included.

Studies will be excluded if they are: conducted in a population of patients discharged from hospice/palliative care wards; residential care awaiting long-term placement or surgical wards (other than orthopedic); community-based studies that do not include

post-hospitalized adults; or studies where participants attended hospital for an emergency department or outpatient service, but were not admitted.

Types of intervention(s)

The review will consider studies that evaluate falls prevention interventions, including but not limited to education (including one–one/group/written/telephone/e-health), exercises (home/group/outpatient), functional assistance as a falls prevention strategy, health professional home visits, medications either withdrawing or taking for falls prevention, multifactorial interventions including combinations of the above. The interventions must have been delivered in hospital or in the first month after discharge from hospital. Interventions that are delivered during the period of six months after hospital will be included as long as they commenced in hospital or during the first month after discharge from hospital.

Comparators

The outcomes of these falls interventions will be compared but not limited to control conditions where there is no falls prevention intervention provided, where usual care is provided for the control group and the intervention group receives the falls prevention intervention in addition to usual care, or where one falls prevention intervention is compared with another falls prevention intervention.

Outcomes

Studies will only be included in this review if an outcome measure related to falls prevalence is used. Since the period of interest is the six months after patients are discharged from hospital, studies must measure the falls outcome within at least six months after discharge from hospital to be included. The outcomes must be measured before and after the investigated intervention. Outcome measures related to falls prevalence may include the rate of falls (expressed as the number of falls per 1000 person days) and the proportion of participants who became fallers (expressed as the percentage of participants who fell); the rates of injurious falls (expressed as the number of falls with injury per 1000 patient days) and the proportion of participants who had an injurious fall (expressed as the percentage of participants who sustained an injury as a result of a fall). Studies that measure falls rates as secondary outcome measures will be included if

they provide data where the falls rate can be calculated.

Types of studies

The review will include any experimental study design that incorporates RCTs, controlled clinical trials and experimental studies where randomization has been used. In the absence of these methods, comparative studies without randomization, cohort and case-control studies will be considered for inclusion. Studies will be included if they have a repeated measures design and compare an intervention against standard treatment, no treatment or another intervention.

Search strategy

The review aims to find both published and unpublished studies. Studies written in English from 1990 to present will be considered. The start date 1990 was considered appropriate as research into falls prevention is considered a relatively recent field of research and other large systematic reviews investigating effective falls interventions include RCTs dated from 1990.¹⁹⁻²⁵ A three-step search strategy will be used when undertaking this review. An initial limited search of MEDLINE (PubMed) and CINAHL Plus with full text (EBSCO) using initial keywords will be undertaken with the aim of identifying all possible keywords from the text, and words contained in the title and abstract of the retrieved literature. A second extensive search using all keywords identified and terms will then be carried out across all included databases. Third, the reference list of all identified literature will be searched for additional studies not previously identified during the first or second search.

The databases to be searched include the Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE, CINAHL, Embase, AMED and PsycINFO. The search for unpublished studies will include an electronic search of trials registers, TROVE, Current Controlled Trials (<http://www.controlled-trials.com>) and the National Institute of Health Clinical Database (<http://www.clinicaltrials.gov>). All studies identified during the database search will be retrieved and two independent reviewers will examine the title, abstract and description/MESH headings of the studies to ensure they meet the inclusion criteria. If the two independent reviewers disagree on whether a study should be included, a third

independent reviewer will be consulted until a consensus has been reached.

Assessment of methodological quality

Studies selected for retrieval will be assessed by two independent reviewers for methodological validity prior to inclusion in the review using standardized critical appraisal instruments from the Joanna Briggs Institute Meta-analysis of Statistics Assessment and Review Instrument (JBI-MAStARI) (Appendix I). Any discrepancies that arise between reviewers will be resolved by discussion or arbitration with a third reviewer if necessary.

Data extraction

Quantitative data will be extracted from the retrieved studies by two independent reviewers using the standardized data extraction tool from the JBI-MAStARI (Appendix II). The data extracted will include details about the interventions, populations, study methods and outcomes of significance to the review objective. Authors of primary studies will be contacted if necessary, to seek clarification or missing information.

Data synthesis

Quantitative data will, wherever possible, be pooled in statistical meta-analysis using Rev-Man Review Manager.²⁶ All results will be subject to double data entry. Statistical analysis will be carried out for primary outcomes wherever possible using the inverse variance method. All studies will be analyzed in terms of primary outcomes where data are available regardless of their settings or combinations of intervention. Heterogeneity will be assessed statistically using the standard χ^2 . Where data can be pooled, subgroup analyses will be explored based on grouping trials with comparable interventions. Risk ratios with 95% confidence intervals will be calculated for analysis. Where statistical pooling is not possible, the findings will be presented in narrative form, including tables and figures to aid in data presentation, where appropriate.

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APPENDIX I: MASTARI appraisal instrument

JBI Critical Appraisal Checklist for Randomised Control / Pseudo-randomised Trial

Reviewer Date

Author Year Record Number

	Yes	No	Unclear	Not Applicable
1. Was the assignment to treatment groups truly random?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Were participants blinded to treatment allocation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Was allocation to treatment groups concealed from the allocator?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Were the outcomes of people who withdrew described and included in the analysis?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Were those assessing outcomes blind to the treatment allocation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Were the control and treatment groups comparable at entry?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Were groups treated identically other than for the named interventions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Were outcomes measured in the same way for all groups?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Were outcomes measured in a reliable way?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Was appropriate statistical analysis used?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Overall appraisal: Include Exclude Seek further info.

Comments (Including reason for exclusion)

APPENDIX II: MASTARI Data extraction instrument

JBI Data Extraction Form for Experimental / Observational Studies

Reviewer Date

Author Year

Journal Record Number

Study Method

RCT Quasi-RCT Longitudinal

Retrospective Observational Other

Participants

Setting _____

Population _____

Sample size

Group A _____ Group B _____

Interventions

Intervention A _____

Intervention B _____

Authors Conclusions:

Reviewers Conclusions:

Study results

Dichotomous data

Outcome	Intervention () number / total number	Intervention () number / total number

Continuous data

Outcome	Intervention () number / total number	Intervention () number / total number