BMJ Open

Educating Hospital Patients to Prevent Falls: Protocol for a Scoping Review

Journal:	*BMJ Open*
Manuscript ID	bmjopen-2019-030952
Article Type:	Protocol
Date Submitted by the Author:	09-Apr-2019
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Keywords:	EDUCATION & TRAINING (see Medical Education & Training), Risk management < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, PUBLIC HEALTH, Falls Prevention, Patient Education

Educating Hospital Patients to Prevent Falls: Protocol for a Scoping Review

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Word count: 1557

ABSTRACT

Introduction

Falls prevention in hospitals is an ongoing challenge world-wide. Despite a wide variety of recommended falls mitigation strategies, few have strong evidence for effectiveness in reducing falls and accompanying injuries. Patient education programmes that promote engagement and enable people to understand their heightened falls risk whilst hospitalised are one approach. The aim of this scoping review is to examine the content, design and outcomes of patient education approaches to hospital falls prevention. As well as critiquing the role of patient education in hospital falls prevention, strategies that can be used in clinical practice shall be recommended.

Methods and analysis

The analysis will apply the methodological framework developed by Arksey and O'Malley and refined by the Joanna Briggs Institute. An initial limited search of CINAHL and PubMed will be completed to identify keywords and index terms. A developed search strategy of Medical Subject Headings and text words will be conducted of PubMed, CINAHL, CENTRAL, AMED, PsychINFO, ERIC and grey literature databases. The reference lists of included articles will be hand searched for additional studies. Three reviewers will screen the titles and abstracts independently and analyse the full text of potential articles based on the inclusion and exclusion criteria. The data will be extracted using a structured data form. Thematic analysis and numerical synthesis of the data will be conducted, and key themes will be identified.

Ethics and dissemination

Results of this scoping review will illuminate the designs and outcomes of patient education research for falls prevention in the current literature. It is anticipated that the findings will highlight best-practice educational design to inform the development of future patient focused education for falls prevention. Study findings will be presented at relevant conferences and published in peer-reviewed journals and public forums. Ethics approval is not required for this literature review.

ARTICLE SUMMARY

Strengths and limitations of this study

- This critical review maps key elements of effective patient education to prevent falls and sheds light on which educational interventions help patients themselves mitigate falling whilst in hospital.
- This review will conduct a quality assessment of patient education programmes in the literature.
- This review will be limited to studies in English conducted in the last 10 years.

BACKGROUND

Falls are an ongoing serious issue within Australian hospitals. They are linked with increased length of stay, poor outcomes and an increased risk of institutionalisation.[1-3] There is an associated rise in costs for hospitals after the occurrence of an in-patient fall, regardless of whether injuries were sustained.[4, 5] Due to the significant cost to health and wellbeing, a growing body of research has investigated the causes of falls in hospitals. The key risk factors include history of past falls, gait instability, balance impairment, cognitive impairment, multi-morbidity, poly-pharmacy and urinary frequency.[6] Falls prevention in hospitals nevertheless remains a difficult task. Most interventions tested in randomised trials to date have not been successful in significantly reducing hospital falls.[2] This is despite careful implementation of different strategies such as education, environmental modifications, mobility aids, alarms and physical therapies.[2, 7, 8]

Emerging research indicates that patient related factors can influence the frequency and severity hospital falls.[9] In particular, falls knowledge and insight of patients into their own falls risk is a key determinant of hospital falls.[10] A qualitative study investigated patients' perceptions of their falls risk and observed a disparity between their perceptions and the actual risk when in hospital.[11] Patients sometimes took unnecessary risks, such as getting out of bed and toileting without assistance and

they did not always engage fully with falls prevention strategies.[12] This was particularly the case for hospitalised patients with dementia, delirium and other cognitive impairments.[13]

While many falls prevention strategies involve some form of education aimed at increasing patient knowledge,[2] few have designed the intervention based on behaviour change models and educational principles or have provided adequate descriptions of these. One randomised control trial delivered an individualised education programme which resulted in significant reduction in the rate of hospital falls and fall related injuries.[14] The study investigated the provision of a patient education programme informed by adult learning and health behaviour change principles, with individually tailored follow-up sessions provided by an educator.[14] Well-designed patient education also has the potential to increase adherence to falls prevention strategies, thereby reducing slips, trips and falls.[15, 16]

Given that patient education has the potential to reduce hospital falls and injuries, more attention needs to be directed towards the structure of patient education programmes, how they are delivered and how to measure their effectiveness. Depending on the characteristics of the target population, further considerations need to be made. For example, people with impaired cognition or of different languages and cultural backgrounds might require different approaches.[13, 17] Likewise, those with a known history of frequent falling may respond to different methods of falls prevention.

This scoping review aims to examine the literature regarding the use and effectiveness of patient education in hospitals to reduce the risk of falls and injuries arising from falls. The specific objectives are to: (1) complete a comprehensive search of patient education interventions for falls prevention in hospitals; (2) evaluate the design of patient hospital falls prevention education programmes and; (3) identify the outcome measures used and where applicable critique their clinimetric properties.

METHODS AND ANALYSIS

The methodological framework developed by Arksey and O'Malley[18] and refined by the Joanna Briggs Institute,[19] will be used along with the PRISMA Extension for Scoping Reviews (PRISMA-ScR).[20] This framework has five stages: (1) Identifying the research question; (2) identifying relevant studies; (3) study selection; (4) data charting; and (5) collating, summarising and reporting the results. [18, 19] Each stage will be discussed in detail below.

This protocol was designed without patient involvement. Patients were not invited to comment on the design and were not consulted to develop patient relevant outcomes. Patients were not invited to contribute to the writing or editing of this document for readability or accuracy.

Stage 1: Identifying the research question

A scoping review aims to identify where the strongest evidence exists as well as opportunities for further research. To identify gaps in knowledge by summarising the breadth of evidence, the research question should be broad. The overarching question developed for this review is "What patient education research has been implemented for falls prevention within hospitals?" Further secondary questions have also been identified to guide the review: (1) What content does the patient education include? (2) Is the education design based on best-practice educational principles and/or behaviour change models? (3) What are the outcomes of patient education research?

Stage 2: Identifying relevant studies

Eligibility criteria

The Joanna Briggs Institute recommends defining the following elements: 'Population', 'Concept' and 'Context' which will guide the inclusion and exclusion criteria.[19] For this review, the population is defined as adult patients (18 years or older) in hospitals. Studies that involve education delivered to families of cognitively impaired individuals will also be included. The key concept in this scoping review is patient education for falls prevention. This includes any studies that assess falls prevention intervention with an aspect of patient education. Studies will only be included if they are in a hospital setting which is the context of the review. Studies will be excluded if they are non-empirical, set in residential care or the community, or involve paediatric populations. Investigations solely on clinician education will also be excluded. To capture the appropriate range of literature, all research study designs are eligible, including quantitative, qualitative and mixed-method studies.

Search strategy

A three-step approach will be utilised to search for published and unpublished studies. First, an initial limited search of Cumulative Index to Nursing and Allied Health Literature (CINAHL) and PubMed will be conducted. Articles identified will be analysed for words contained in the title and abstract, and of the index terms used to describe the articles. Medical subject headings (MeSH) and words related to patient education and falls prevention in hospital will be developed by a qualified librarian in conjunction with previously identified key words and index terms. A second search will then be undertaken across the following databases: PubMed, CINAHL, the Cochrane Central Register of Controlled Trials (CENTRAL), Allied and Complementary Medicine Database (AMED), PsychINFO and Education Resources Information Center (ERIC). The search for unpublished studies will include Trove and ProQuest Theses and Dissertations Global. Articles will be limited to the English language and the last 10 years. The search strategy for CINAHL can be found in the supplementary file. Finally, the reference list of all identified reports and articles will be searched for additional studies.

Stage 3: Study selection

Three reviewers will independently screen the title and abstracts of retrieved papers to identify potentially relevant articles. The full text of the identified papers will be obtained and assessed by three independent reviewers. Any discrepancies will be resolved through discussions, and if required, consensus will be achieved by seeking input from a fourth reviewer. Covidence, a web-based platform which streamlines the production of systematic reviews, will be used to assist the screening of articles. Results of the search strategy, including the final included and excluded studies will be presented in a PRISMA flow diagram.[20]

Stage 4: Data Charting

A data extraction chart will be utilised. Abstracted data will include the following items: author, year of publication, country of origin, aims of the study, patient characteristics, education design characteristics, research methodology, measurement tools and reported outcomes. Additional variables may be identified following complete review of the full text. Once data has been extracted, the quality of patient education will be charted using a quality metric. The metric is a tool created by Kiegaldie and Farlie[21] to assess the quality of education programmes delivered to health professionals in the context of falls prevention research. This review will use a modified version which excludes items specific to clinician education, and can be found in the supplementary file. For the purposes of this review, the 'learner' is the patient. As formal quality assessment of articles is

generally not required due to the nature of scoping reviews,[18, 19] a broad overview of the research quality of the studies will be included instead.

Stage 5: Collating, summarising and reporting the results

The data extracted will be summarised qualitatively via thematic analysis and quantitative data will be summarised using numerical counts. Where appropriate, interventions will be categorised as: (1) those that directly educate patients; (2) environmental modifications where patient education is involved; (3) systems, policies and procedures that include patient education for hospital falls and; (4) consumer materials such as brochures, pamphlets or handouts. Results will be presented as tables, charts and diagrams where appropriate, to allow for easy comparison. Following synthesis and analysis of the data, this scoping review will be able to identify areas for future research.

ETHICS AND DISSEMINATION

This scoping review does not require ethics approval as data will be obtained through review of existing literature. Study findings will be presented at relevant conferences and published in peer-reviewed journals and public forums.

The link between effective patient education, empowerment and adherence should not be underestimated. By drawing on this link, we hope to inform the direction of future research in empowering patients to recognise their falls risk and promote engagement with falls prevention strategies whilst they are in hospital.

Acknowledgments

This scoping review is being conducted as a part of an NHMRC funded public-private partnership (#GNT1152853) which aims to utilise implementation science principles to enable both clinicians and patients to better mitigate future risk of hospital falls and to reduce falls rates. The partnership is between the Healthscope private hospital network, Holmesglen Institute and Australian universities.

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Author Statement

All authors contributed to the preparation, drafting and editing of this scoping review protocol. HH, LS, MM and DK designed the protocol. HH wrote the first draft, and DK, MM and A-MH critically appraised and revised the manuscript. All authors read and approved the final version of the manuscript.

Funding

This work was supported by NHMRC grant number #GNT1152853.

Competing interests statement

All authors report a grant from the National Health and Medical Research Council Australia to fund this project, during the conduct of the study.

Word count

1557 excluding title page, abstract and references.

Supplementary File for Scoping Review Protocol

Search Strategy

CINAHL

#	Query	Limiters/Expanders	Results
S13	S4 AND S9	Limiters - Published Date: 20080101-20191231 Narrow by Language: - english Narrow by SubjectAge: - all adult Search modes - Boolean/Phrase	2,850
S12	S4 AND S9	Limiters - Published Date: 20080101-20191231 Narrow by SubjectAge: - all adult Search modes - Boolean/Phrase	3,089
S11	S4 AND S9	Limiters - Published Date: 20080101-20191231 Search modes - Boolean/Phrase	9,721
S10	S4 AND S9	Search modes - Boolean/Phrase	15,581
S9	S5 OR S6 OR S7 OR S8	Search modes - Boolean/Phrase	90,953
S8	patient education OR patient education handout OR Carers education OR Carer education OR Caregiver education OR Care Givers education OR Spouse Caregivers education OR Spouse Caregiver education OR Family Caregivers education OR Family Caregiver education OR Hospital falls OR patient falls OR Reducing fall OR reduce fall OR reduce falls OR reducing falls OR falls reduction OR fall reduction OR reduced falls OR reduced fall OR Fallers OR Fall prevention OR Falls prevention OR Preventing falls OR Preventing fall OR prevent falls OR fall rates OR recurrent fall OR falls intervention OR falls prevention intervention OR inpatient fall*	Search modes - Boolean/Phrase	90,953
S7	(MH "Accidental Falls/PC")	Search modes - Boolean/Phrase	8,329
S6	(MH "Caregivers/ED")	Search modes - Boolean/Phrase	1,936
S5	(MH "Patient Education")	Search modes - Boolean/Phrase	57,406
S4	S1 OR S2 OR S3	Search modes - Boolean/Phrase	450,195

Supplementary File for Scoping Review Protocol

	Inpatient* OR Hospitals OR private hospital* OR geriatric hospital* OR public hospital* OR teaching hospital* OR general hospital* OR aged hospital* OR community hospital* OR university hospital* OR acute hospital* OR subacute hospital* OR sub-acute hospital* OR rehab* hospital* OR community hospital* OR rural		
S3	hospital* OR urban hospital*	Search modes - Boolean/Phrase	450,195
S2	(MH "Hospitals")	Search modes - Boolean/Phrase	51,294
S1	(MH "Inpatients")	Search modes - Boolean/Phrase	74,363

Modified quality metric of education design

Item	Key questions
Purpose / Aim / Significance	Is the purpose and rationale of the education program stated? Is there a clear direction to the program? Is there a satisfactory description of the significance of the program?
Context	Is the education conducted in a suitable setting?
Learner characteristics	Is the program pitched towards an appropriate audience? Is there recognition of learner's prior knowledge/experience?
Teacher characteristics	Is there a description of who is teaching the program? Are the teachers qualified and/or experienced on the topic? Are the teachers qualified and/or experienced in teaching? Is training on the program offered?
Learning activities	Is there description of the learning activities? Are the learning activities suitable for supporting learners to meet the learning objectives?

Supplementary File for Scoping Review Protocol

Assessment of learning	Is there an assessment of learners achievement of learning objectives (knowledge, skills, attitudes)
Education evaluation	Has an evaluation been planned? Is the evaluation method appropriate? Has an evaluation been conducted? Are the education outcomes reported for process (learner's views on the teaching)

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Primary Subject Heading:	Public health
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ABSTRACT

Introduction

Falls prevention in hospitals is an ongoing challenge world-wide. Despite a wide variety of recommended falls mitigation strategies, few have strong evidence for effectiveness in reducing falls and accompanying injuries. Patient education programmes that promote engagement and enable people to understand their heightened falls risk whilst hospitalised are one approach. The aim of this scoping review is to examine the content, design and outcomes of patient education approaches to hospital falls prevention. As well as critiquing the role of patient education in hospital falls prevention, strategies that can be used in clinical practice shall be recommended.

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The analysis will apply the methodological framework developed by Arksey and O'Malley and refined by the Joanna Briggs Institute. An initial limited search of CINAHL and PubMed will be completed to identify keywords and index terms. A developed search strategy of Medical Subject Headings and text words will be conducted of PubMed, CINAHL, CENTRAL, AMED, PsychINFO, ERIC and grey literature databases from January 2008 to current. The reference lists of included articles will be hand searched for additional studies. Two reviewers will screen the titles and abstracts independently and analyse the full text of potential articles based on the inclusion and exclusion criteria. The data will be extracted using a structured data form. Thematic analysis and numerical synthesis of the data will be conducted, and key themes will be identified.

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Results of this scoping review will illuminate the designs and outcomes of patient education research for hospital falls prevention in the current literature. It is anticipated that the findings will highlight best-practice educational design to inform the development of future patient focused education for falls prevention. Study findings will be presented at relevant conferences and published in peer-reviewed journals and public forums. Ethics approval is not required.

ARTICLE SUMMARY

Strengths and limitations of this study

- This critical scoping review maps key elements of effective patient education to prevent falls and sheds light on which educational interventions help patients themselves mitigate falling whilst in hospital.
- This review will conduct a quality assessment of patient education programmes in the literature.
- This review will be limited to studies in English conducted in the last 10 years.

BACKGROUND

Falls are an ongoing serious issue within Australian hospitals. They are linked with increased length of stay, poor functional outcomes and an increased risk of institutionalisation.[1-3] There is an associated rise in costs for hospitals after the occurrence of an in-patient fall, regardless of whether injuries were sustained.[4, 5] Due to the significant cost to health and wellbeing, a growing body of research has investigated the causes of falls in hospitals. Some key risk factors include history of past

falls, gait instability, balance impairment, cognitive impairment, multi-morbidity, poly-pharmacy and urinary frequency.[6, 7] Falls prevention in hospitals nevertheless remains a difficult task. Whereas single interventions have not been very successful in reducing hospital fall rates,[2, 8-11] multifactorial interventions might be effective for some individuals, particularly in sub-acute and aged care settings.[2, 12-14] Nevertheless, despite careful implementation of different strategies such as education, environmental modifications, mobility aids, alarms and physical therapies[2, 15, 16] as defined in the ProFaNE classification,[17] it is unclear how falls can be routinely prevented in hospitals, or the relative contribution of patient education.

Emerging research indicates that patient related factors can influence the frequency and severity hospital falls.[18] In particular, falls knowledge and insight of patients into their own falls risk is a key determinant of hospital falls.[19] A qualitative study investigated patients' perceptions of their falls risk and observed a disparity between their perceptions and the actual risk when in hospital.[20] Patients sometimes took unnecessary risks, such as getting out of bed and toileting without assistance and they did not always engage fully with falls prevention strategies.[21] This was particularly the case for hospitalised patients with dementia, delirium and other cognitive impairments.[22]

While many falls prevention strategies involve some form of education aimed at increasing patient knowledge,[2] few have designed the intervention based on behaviour change models and educational principles or have provided adequate descriptions of these.[23, 24] One randomised control trial delivered an individualised education programme which resulted in significant reduction in the rate of hospital falls and fall related injuries.[25] The study investigated the provision of a patient education programme informed by adult learning and health behaviour change principles, with individually tailored follow-up sessions provided by an educator.[25] Well-designed patient education also has the potential to increase adherence to falls prevention strategies, thereby reducing slips, trips and falls.[26, 27]

Given that patient education has the potential to reduce hospital falls and injuries, more attention needs to be directed towards the structure of patient education programmes, how they are delivered and how to measure their effectiveness. Depending on the characteristics of the target population, further considerations need to be made. For example, people with impaired cognition or of different languages and cultural backgrounds might require different approaches.[22, 28] Likewise, those with a known history of frequent falling may respond to different methods of falls prevention.

Our scoping review shall provide a new and detailed analysis of the benefits and limitations of patient education strategies for mitigation of falls in acute hospitals and sub-acute settings such as rehabilitation units. Even though a Cochrane review of falls prevention interventions was conducted by Cameron and colleagues,[2] that analysis was restricted to adults over 65 years of age, or studies with a mean age greater than 65 years. The Cameron review excluded interventions that took place in hospital emergency departments or hospital outpatient settings.[2] It did not provide details on the exact methods used to educate hospitalised patients on how to prevent falling, or details on the mode of delivery, such as handouts, posters, multi-media or face to face discussions. The current scoping review shall address these gaps, as well as including more recent data published since the Cameron review.

We shall conduct a scoping review of the literature to map evidence, given the paucity of published reports on patient education to reduce hospital falls, and the wide variations in the interventions and methodologies used in existing studies. According to the Joanna Briggs Institute (JBI), scoping reviews are particularly helpful for assembling evidence from disparate or heterogeneous sources.[29, 30] Scoping reviews also "…provide a map of what evidence has been produced as opposed to seeking

only the best available evidence to answer a particular question related to policy and practice".[29] They are very helpful for identifying gaps in the literature and for mapping key concepts underpinning a research area and elucidating working definitions.[29, 31] Our scoping review will therefore bring together existing and emerging evidence from a broad range of sources and with different levels of quality, to crystalize the key concepts underpinning this research area and to clarify working definitions.

This scoping review aims to examine the literature regarding the use and effectiveness of patient education in hospitals to reduce the risk of falls and injuries arising from falls. The specific objectives are to: (1) examine patient education interventions for falls prevention in hospitals; (2) evaluate the design of patient hospital falls prevention education programmes and; (3) identify the outcome measures used and where applicable critique their clinimetric properties.

METHODS AND ANALYSIS

The methodological framework developed by Arksey and O'Malley[31] and refined by the Joanna Briggs Institute,[30] will be used along with the PRISMA Extension for Scoping Reviews (PRISMA-ScR).[32] This framework has five stages: (1) Identifying the research question; (2) identifying relevant studies; (3) study selection; (4) data charting; and (5) collating, summarising and reporting the results. [30, 31] Each stage will be discussed in detail below.

Patient and Public Involvement

This protocol was designed with patient involvement at each step and consumers will be involved in the review and its dissemination. Consumer representatives were invited to comment on the design and contributed to the editing of this document.

Stage 1: Identifying the research question

A scoping review aims to identify where the strongest evidence exists as well as opportunities for further research. To identify gaps in knowledge by summarising the breadth of evidence, the research question should be broad. The overarching question developed for this review is "What patient education research has been implemented for falls prevention within hospitals?" Further secondary questions have also been identified to guide the review: (1) What content does the patient education include? (2) Is the education design based on best-practice educational principles and/or behaviour change models? (3) What are the outcomes of patient education research?

Stage 2: Identifying relevant studies

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The Joanna Briggs Institute recommends defining the following elements: 'Population', 'Concept' and 'Context' which will guide the inclusion and exclusion criteria.[30] For this review, the population is defined as adult patients (18 years or older) who are hospitalised. Studies that involve education delivered to families of cognitively impaired individuals will also be included. The key concept in this scoping review is patient education for falls prevention. This includes any studies that assess falls prevention intervention with an aspect of patient education, such as multifactorial interventions. Studies will only be included if they are in a hospital setting (e.g. acute, sub-acute, rehabilitation) which is the context of the review. Studies will be excluded if they are non-empirical, set in residential care or the community, or involve paediatric populations. Investigations solely on

clinician education will also be excluded. To capture the appropriate range of literature, all research study designs are eligible, including quantitative, qualitative and mixed-method studies.

Search strategy

A three-step approach will be utilised to search for published and unpublished studies. First, an initial limited search of Cumulative Index to Nursing and Allied Health Literature (CINAHL) and PubMed will be conducted. Articles identified will be analysed for words contained in the title and abstract, and of the index terms used to describe the articles. Medical subject headings (MeSH) and words related to patient education and falls prevention in hospital will be developed by a qualified librarian in conjunction with previously identified key words and index terms. A second search will then be undertaken across the following databases: PubMed, CINAHL, the Cochrane Central Register of Controlled Trials (CENTRAL), Allied and Complementary Medicine Database (AMED), PsychINFO and Education Resources Information Center (ERIC). This process will be iterative to ensure all relevant search terms are captured. The search for unpublished studies will include Trove and ProQuest Theses and Dissertations Global. Articles will be limited to the English language and the last 10 years from January 2008 to current. This is to ensure that the data is up to date as hospital systems have changed over time and new falls prevention programs are being implemented. The search strategy for CINAHL can be found in the supplementary file. Finally, the reference list of all identified reports and articles will be searched for additional studies.

Stage 3: Study selection

Two reviewers will independently screen the title and abstracts of retrieved papers to identify potentially relevant articles. The full text of the identified papers will be obtained and assessed by two independent reviewers. Any discrepancies will be resolved through discussions, and if required, consensus will be achieved by seeking input from a third reviewer. Covidence, a web-based platform which streamlines the production of systematic reviews, will be used to assist the screening of articles. Results of the search strategy, including the final included and excluded studies will be presented in a PRISMA flow diagram.[32]

Stage 4: Data Charting

A data extraction chart will be utilised. Abstracted data will include the following items: author, year of publication, country of origin, aims of the study, patient characteristics, hospital setting, education design characteristics, research methodology, measurement tools and reported outcomes. Additional variables may be identified following complete review of the full text. The same two reviewers will independently chart the data. Once data has been extracted, the quality of patient education will be charted using a quality metric. The metric is a tool created by Kiegaldie and Farlie[33] to assess the quality of education programmes delivered to health professionals in the context of falls prevention research. This review will use a version modified by the authors which excludes items specific to clinician education, and can be found in the supplementary file. For the purposes of this review, the 'learner' is the patient and "co-learner" as families or carers of cognitively impaired patients. As formal quality assessment of articles is generally not required due to the nature of scoping reviews,[30, 31] a broad overview of the research quality of the studies will be included instead.

Stage 5: Collating, summarising and reporting the results

The data extracted will be summarised qualitatively via thematic analysis and quantitative data will be summarised using numerical counts. For this scoping review we decided to use expert reviewers

rather than commercially available software to analyse the results and identify key themes. An iterative process of identifying new categories and themes will arise through ongoing analysis. Where appropriate, interventions will be categorised as: (1) approaches that directly educate patients; (2) environmental modifications where patient education is involved; (3) systems, policies and procedures that include patient education and; (4) consumer materials for falls prevention. These interventions will be classified according to the mode of delivery, such as through face to face discussions, videos, brochures, posters, handouts, or multi-media. Single interventions or multi-modal methods of patient falls education will be investigated. Links between quality of patient education and outcome measures (falls or educational) will also be identified and reported. If reported, educational design principles will be evaluated for best practice based on the recommendations of ProFaNE.[34] Some of these recommendations include raising awareness of falls, promoting positive self-identity and encouraging self-management.[34, 35]

We shall distinguish between effective and non-effective fall prevention educational programs by examining a combination of outcomes, such as the number of fallers divided by the total number of patients for a given unit (risk of falls); the rate of falls over a given time taking into account exposure, such as the number of falls per occupied bed days, expressed as falls per 1000 bed days (falls rate). Moreover, we shall examine effectiveness of falls prevention in relation to the quality of the educational interventions as reflected by patient knowledge, compliance and satisfaction. Results will be presented as tables, charts and diagrams where appropriate, to allow for easy comparison. Following synthesis and analysis of the data, this scoping review will be able to identify the strengths and limitations of existing methods of patient education and areas for future research.

ETHICS AND DISSEMINATION

This scoping review does not require ethics approval as data will be obtained through review of existing literature. Study findings will be presented at relevant conferences and published in peer-reviewed journals and public forums.

The link between effective patient education, empowerment and adherence as well as effective process implementation should not be underestimated. By drawing on this link, we hope to inform the direction of future research in empowering patients to recognise their falls risk and promote engagement with falls prevention strategies whilst they are in hospital.

Acknowledgments

This scoping review is being conducted as a part of an NHMRC funded public-private partnership (#GNT1152853) which aims to utilise implementation science principles to enable both clinicians and patients to better mitigate future risk of hospital falls and to reduce falls rates. The partnership is between the Healthscope private hospital network, Holmesglen Institute and Australian universities.

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Author Statement

All authors contributed to the preparation, drafting and editing of this scoping review protocol. HH, LS, MM and DK designed the protocol. HH wrote the first draft, and DK, MM, DJ and A-MH critically appraised and revised the manuscript. All authors read and approved the final version of the manuscript.

Funding

This work was supported by NHMRC grant number #GNT1152853.

Competing interests statement

All authors report a grant from the National Health and Medical Research Council Australia to fund this project, during the conduct of the study.

Word count

2200 excluding title page, abstract and references.

Supplementary File for Scoping Review Protocol

Initial Limited Search Terms

	PubMed	CINAHL
Search Terms	Accidental Falls/mortality Accidental Falls/prevention & control* Aged, 80 and over Cognition/classification Comorbidity Education, Continuing/organization & administration Health Education/organization & administration* Health Education/statistics & numerical data* Incidence Patient Education as Topic/organization & administration Patient Education as Topic/statistics & numerical data Patient Outcome Assessment Program Evaluation Rehabilitation/education Treatment Outcome	MH "Hospitals" MH "Inpatients" MH "Accidental Falls/PC" MH "Caregivers/ED" MH "Patient Education"

Supplementary File for Scoping Review Protocol

Final Search Strategy

CINAHL

#	Query	Limiters/Expanders	Results
S13	S4 AND S9	Limiters - Published Date: 20080101-20191231 Narrow by Language: - english Narrow by SubjectAge: - all adult Search modes - Boolean/Phrase	2,850
S12	S4 AND S9	Limiters - Published Date: 20080101-20191231 Narrow by SubjectAge: - all adult Search modes - Boolean/Phrase	3,089
S11	S4 AND S9	Limiters - Published Date: 20080101-20191231 Search modes - Boolean/Phrase	9,721
S10	S4 AND S9	Search modes - Boolean/Phrase	15,581
S9	S5 OR S6 OR S7 OR S8	Search modes - Boolean/Phrase	90,953
S8	patient education OR patient education handout OR Carers education OR Carer education OR Caregiver education OR Care Givers education OR Spouse Caregivers education OR Spouse Caregiver education OR Family Caregivers education OR Family Caregiver education OR Hospital falls OR patient falls OR Reducing fall OR reduce fall OR reduce falls OR reducing falls OR falls reduction OR fall reduction OR reduced falls OR reduced fall OR Fallers OR Fall prevention OR Falls prevention OR Preventing falls OR Preventing fall OR prevent falls OR fall rates OR recurrent fall OR falls intervention OR falls prevention intervention OR inpatient fall*	Search modes - Boolean/Phrase	90,953
S7	(MH "Accidental Falls/PC")	Search modes - Boolean/Phrase	8,329
S6	(MH "Caregivers/ED")	Search modes - Boolean/Phrase	1,936
S5	(MH "Patient Education")	Search modes - Boolean/Phrase	57,406
S4	S1 OR S2 OR S3	Search modes - Boolean/Phrase	450,195
S3	Inpatient* OR Hospitals OR private hospital* OR geriatric hospital* OR public hospital* OR teaching hospital* OR general hospital* OR aged hospital* OR community hospital* OR university hospital* OR acute hospital* OR subacute hospital* OR sub-acute hospital* OR rehab* hospital* OR community hospital* OR rural hospital* OR urban hospital*	Search modes - Boolean/Phrase	450,195
S2	(MH "Hospitals")	Search modes - Boolean/Phrase	51,294
S1	(MH "Inpatients")	Search modes - Boolean/Phrase	74,363

Supplementary File for Scoping Review Protocol

Modified quality metric of education design

Item	Key questions
Purpose / Aim / Significance	Is the purpose and rationale of the education program stated? Is there a clear direction to the program? Is there a satisfactory description of the significance of the program?
Context	Is the education conducted in a suitable setting?
Learner/Co-Learner characteristics	Is the program pitched towards an appropriate audience? Is there recognition of learner's/co-learner's prior knowledge/experience?
Teacher characteristics	Is there a description of who is teaching the program? Are the teachers qualified and/or experienced on the topic? Are the teachers qualified and/or experienced in teaching? Is training on the program offered?
Learning activities	Is there description of the learning activities? Are the learning activities suitable for supporting learners/co-learners to meet the learning objectives?
Assessment of learning	Is there an assessment of learners/co-learners achievement of learning objectives (knowledge, skills, attitudes)
Education evaluation	Has an evaluation been planned? Is the evaluation method appropriate? Has an evaluation been conducted? Are the education outcomes reported for process (learner's/co-learner's views on the teaching)

Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
TITLE			
Title	1	Identify the report as a scoping review.	1
ABSTRACT			
Structured summary	2	Provide a structured summary that includes (as applicable): background, objectives, eligibility criteria, sources of evidence, charting methods, results, and conclusions that relate to the review questions and objectives.	2
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known. Explain why the review questions/objectives lend themselves to a scoping review approach.	2, 3
Objectives	4	Provide an explicit statement of the questions and objectives being addressed with reference to their key elements (e.g., population or participants, concepts, and context) or other relevant key elements used to conceptualize the review questions and/or objectives.	4
METHODS			
Protocol and registration	5	Indicate whether a review protocol exists; state if and where it can be accessed (e.g., a Web address); and if available, provide registration information, including the registration number.	N/A
Eligibility criteria	6	Specify characteristics of the sources of evidence used as eligibility criteria (e.g., years considered, language, and publication status), and provide a rationale.	4
Information sources*	7	Describe all information sources in the search (e.g., databases with dates of coverage and contact with authors to identify additional sources), as well as the date the most recent search was executed.	4, 5
Search	8	Present the full electronic search strategy for at least 1 database, including any limits used, such that it could be repeated.	Supplementary File
Selection of sources of evidence†	9	State the process for selecting sources of evidence (i.e., screening and eligibility) included in the scoping review.	5
Data charting process‡	10	Describe the methods of charting data from the included sources of evidence (e.g., calibrated forms or forms that have been tested by the team before their use, and whether data charting was done independently or in duplicate) and any processes for obtaining and confirming data from investigators.	5
Data items	11	List and define all variables for which data were sought and any assumptions and simplifications made.	5
Critical appraisal of individual	12	If done, provide a rationale for conducting a critical appraisal of included sources of evidence; describe	5

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
sources of evidence§		the methods used and how this information was used in any data synthesis (if appropriate).	
Synthesis of results	13	Describe the methods of handling and summarizing the data that were charted.	5, 6
RESULTS			
Selection of sources of evidence	14	Give numbers of sources of evidence screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally using a flow diagram.	N/A
Characteristics of sources of evidence	15	For each source of evidence, present characteristics for which data were charted and provide the citations.	N/A
Critical appraisal within sources of evidence	16	If done, present data on critical appraisal of included sources of evidence (see item 12).	N/A
Results of individual sources of evidence	17	For each included source of evidence, present the relevant data that were charted that relate to the review questions and objectives.	N/A
Synthesis of results	18	Summarize and/or present the charting results as they relate to the review questions and objectives.	N/A
DISCUSSION			
Summary of evidence	19	Summarize the main results (including an overview of concepts, themes, and types of evidence available), link to the review questions and objectives, and consider the relevance to key groups.	N/A
Limitations	20	Discuss the limitations of the scoping review process.	N/A
Conclusions	21	Provide a general interpretation of the results with respect to the review questions and objectives, as well as potential implications and/or next steps.	N/A
FUNDING			
Funding	22	Describe sources of funding for the included sources of evidence, as well as sources of funding for the scoping review. Describe the role of the funders of the scoping review.	6

JBI = Joanna Briggs Institute; PRISMA-ScR = Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews.

* Where *sources of evidence* (see second footnote) are compiled from, such as bibliographic databases, social media platforms, and Web sites.

† A more inclusive/heterogeneous term used to account for the different types of evidence or data sources (e.g., quantitative and/or qualitative research, expert opinion, and policy documents) that may be eligible in a scoping review as opposed to only studies. This is not to be confused with *information sources* (see first footnote).

‡ The frameworks by Arksey and O'Malley (6) and Levac and colleagues (7) and the JBI guidance (4, 5) refer to the process of data extraction in a scoping review as data charting.

§ The process of systematically examining research evidence to assess its validity, results, and relevance before using it to inform a decision. This term is used for items 12 and 19 instead of "risk of bias" (which is more applicable to systematic reviews of interventions) to include and acknowledge the various sources of evidence that may be used in a scoping review (e.g., quantitative and/or qualitative research, expert opinion, and policy document).

From: Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation. Ann Intern Med. ;169:467–473. doi: 10.7326/M18-0850