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“Falls prevention among older people and care providers: Protocol for an integrative review”.

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## Abstract

**Aim.** To review the evidence about the role of care providers in fall prevention in older adult's aged  $\geq 65$  years, this includes their views, strategies and approaches on falls prevention and effectiveness of nursing interventions.

**Background.** Some falls prevention programmes are successfully implemented and led by nurses and it is acknowledged the vital role they play in developing plans for fall prevention. Nevertheless, there has not been a systematic review of the literature that describes this role and care providers' views on fall's prevention initiatives.

**Design.** A convergent synthesis of qualitative, quantitative and mixed methods studies. The eligibility criteria will be based on participants, interventions/exposure, comparisons and outcomes for quantitative studies and on population, the phenomena of interest and the context, for qualitative studies. To extract data and assess studies qualities members of the research team will work in pairs according to their expertise. The review will follow the guidelines for integrative reviews and the proposed methods will adhere to the PRISMA statement checklist complemented by the ENTREQ framework. As qualitative synthesis are emergent, all procedures and changes in procedure will be documented.

**Discussion.** The review has a constructivist drive as studies that combine methods ought to be paradigmatic driven. Review questions are broad to allow issues emerge and have purposefully left the design flexible to allow for adjustments as the review progresses. The review seeks to highlight the roles that care providers play in fall prevention and their views on fall's prevention initiatives.

## **Key words:**

ageing, community and public health, Europe, falls, care giving, library methods, older people, nursing, review.

## **Why this review is needed**

- There is a wealth of literature on falls prevention and systematic reviews have identified effective interventions, however, limited attention has been paid to care providers' perspectives and role in falls prevention.
- There has not been a systematic review of the literature that describes care providers role and views on falls prevention initiatives.
- Findings from this review will provide relevant information for the development of best practice guidelines for falls prevention and will contribute to the design of multifactorial interventions. Reviewed cases might serve as examples of good practices in falls prevention among older people.
- Falls prevention is a complex intervention, uncovering the role and perspectives of care providers will contribute to implementation programmes.

## **INTRODUCTION**

Falls are a common problem affecting older people and their incidence increases with age. Nowadays, 30% of people over 65 living in their homes have a fall (Campbell et al. 1990, EuroSafe 2014). In Europe falls cause 29% of fatal injuries of older people (60+), in

particular of women (EuroSafe 2014). Falling down at home, causes 54 per cent of all falling-related deaths of older people and 20 percent of those mortal falls occur in residential institutions (National Safety Council 2014). To reduce falls among older people is a priority in Europe and a target in many countries (COM 2012, EIP 2012).

Hip fracture is the most common serious injury from falling. Of all people suffering a hip fracture from falling, more than 24 per cent will die within a year and 50 percent will never regain their prior level of independence (National Safety Council 2014). Incidence rates in hospitals and in long-term care are higher too (WHO 2007). For the person who suffers the fall, it is usually a tragic or frightening event that can lead to loss of confidence and autonomy and a reduction of his or her quality of life (Salkeld *et al.* 2000, Weeks & Roberto 2002); for the family it can be a cause of anxiety (Liddle & Gilleard 1995). Also, for older people, their families and the health care system, the costs of falls are important (WHO 2007, Todd & Skelton 2004). These will continue to increase producing in Europe higher costs in the health care services (Todd & Skelton 2004).

Falls are considered a public health issue as they have a wider social and economic impact (Ruchinskas 2003, WHO 2007, Bleijlevens *et al.* 2008). A wealth of research has been undertaken to evidence how best to prevent falls with interventions. Well-researched interventions include medication review, fall alarms and environmental aids (Akyol 2007). However, the most effective interventions require a multifactorial approach (Cameron *et al.* 2012, Gillespie *et al.* 2012, Goodwin *et al.* 2014). In this approach it has been reported that conducting an assessment after a fall followed by a multidisciplinary intervention are components for its success (EIP 2012). Falls prevention programmes aim to increase older people's functional capacity, decrease the number of falls, prevent falls and decrease injuries occurring from a fall. A comprehensive falls prevention program for older people often

comprise interventions involving several components, a multidisciplinary team (MDT) approach and its implementation in a variety of settings (Lamb *et al.* 2011). Nowadays, the majority of health interventions are considered complex (Moore *et al.* 2015). Falls prevention is clearly the case as it comprises multiple interactions and with a variety of outcomes components implemented in different contexts involving different institutions (Richards & Hallberg 2015).

Of significance for its comprehensiveness is the World Health Organization (WHO) Model for reducing falls and fall-related injuries among older persons. This model aims at identifying policies, practices and procedures that will raise awareness of the importance of preventing falls, improve the identification of risk factors and promote culturally-appropriated evidence based interventions to prevent older people from falling (WHO 2007). According to this framework, preventive strategies should be adjusted to the older person and to the context where he/she lives. Social groups and health care professionals are involved in the implementation of this model and the temporal character of falls is acknowledged. By the same token, it has been pointed out that methods to reduce falls should engage patients and families in their 'fall safety process' along with other strategies, by 'strengthening the care giving patient relationship' (DuPree, Fritz-Campiz & Mushemo 2014, p.100).

## **Background**

Falls prevention interventions are moving beyond individual focus centred activities to consider, the social context and relationships involved in preventive initiatives. Some falls prevention programmes are successfully implemented and led by nurses (Zijlstra *et al.* 2012) and it is acknowledged the vital role that they play in developing plans for fall prevention (Graham 2012). A randomized control trial showed that a cognitive behavioural programme implemented by community nurses significantly reduced older persons' concerns about falls,

disability and indoor falls among frail older people (Dorresteijn *et al.* 2016). On the other hand, occupational therapists appear to be more effective in implementing home safety interventions than non-occupational therapist (Gillespie *et al.* 2012). It has also been found that who delivers these preventive programmes influences participant's attendance (Hawley-Hague *et al.* 2013). A recent study uncovered the centrality of careful practice for enhancing fall prevention services among community nurses (Shaw *et al.* 2014) In hospital settings falls prevention tends to be part of institutional patient safety programmes and initiatives where nurses are key actors (Ralph & Gabriele 2014).

The challenge nowadays in falls prevention is to deliver the most effective interventions efficiently at population level as well as to those interventions be taken by older people themselves (Day *et al.* 2011). Translational research has identified the importance of cultural and context bound barriers to implementing evidence. Studies have documented the barriers' in participation and adherence to falls' prevention initiatives (Yardley *et al.* 2006, McInnes *et al.* 2011, Hawley-Hague *et al.* 2013). Recently the role that care providers and social network play in the implementation process has been uncovered. Hence, it has been found that instructor and individual participant variables were of importance to understand attendance and adherence to community exercise classes (Hawley-Hague *et al.* 2013). Also, a qualitative study carried out in Europe found that the support from family and friends and the personal request of health professionals motivate to participate in falls prevention programmes (Yardley *et al.* 2006). However, a critical review showed the scant presence of family caregivers in intervention programs for falls prevention (de la Cuesta-Benjumea & Roe 2015) disregarding their role in making changes to the environment, in supporting to older people who have fallen and in promoting their confidence (Horton & Arber 2004, Roe *et al.* 2009).

Despite the role that care providers play in falls prevention and the acknowledged need to involve them in activities and programs to prevent older people from falling, there has not been a systematic review of the literature that describes this role and care providers' views on fall's prevention initiatives.

In many countries in Europe, reduction of falls in older people is a health care target and a priority (COM 2012, EIP 2012). Different approaches to falls' prevention have emerged and studies are uncovering the effect that have the personnel that delivers the intervention (Gillespie *et al.*, 2012). Hence, the following questions can be asked what the care providers' roles are and what are the interventions they engage? What are their views on falls prevention activities and programmes? What is their effectiveness? The answers to these questions will contribute to the promotion of falls prevention in the community and health care facilities. To uncover the role that health care providers play in fall prevention will raise awareness of the importance their participation in falls prevention programmes have and will facilitate the promotion of effective activities. This study is consistent with the European plan on active ageing (COM 2012, EIP 2012) and with the research programme 'Horizon 2020' (European Commission 2012). This review will provide relevant information for the development of best practice guidelines for falls prevention; it will contribute to the design of multifactorial interventions. Reviewed cases might serve as examples of good practices in falls prevention among older people. The review in this way, is attuned with the World Health Organization for nursing and midwifery (WHO 2015) as it will promote the uptake and use of research evidence by practitioners.

The review we are proposing fits with the present trend to develop systematic review to include questions different from those focused on evidence of effectiveness (Popay & Roberts 2006). It also echoes the increasing interest of including qualitative evidence in

systematic reviews (Harden 2006) and the need for policy makers and practitioners to have a diversity of synthesized evidence (Dixon-Woods *et al.* 2005).

## THE REVIEW

### **Aim**

The aim of this integrative review is to identify, appraise and synthesize the empirical evidence about the role of care providers in fall prevention in older adult's aged  $\geq 65$  years/older people; this includes considering their views, identifying the strategies and approaches they use on falls prevention and the effectiveness of their preventive interventions. This review will generate a record of existing research in this area, a final purpose that not always is acknowledged (Evans 2007).

To achieve the above aim, our initial review questions are:

1. What is the role of nursing and caregivers in falls prevention in older adults aged  $\geq 65$  years in the community and in health care facilities (acute care, long-term care, nursing home and rehabilitation)? Specifically:

1.1 What are the activities that nurses, nursing aids, auxiliary nurses, health care assistants, informal and family caregivers engage in to prevent older people from falling?

1.2 How do they implement fall prevention strategies?

1.3 What approaches do they use to prevent their patients or relatives from falling?

2. What are care providers' points of view about falls' prevention programs and initiatives?

3. What are the differences and similarities of nursing interventions in the community and in health care facilities (acute care, long-term care, nursing home and rehabilitation) to prevent older people from falling?

4. What is the effectiveness of nursing interventions in falls prevention in older adults' aged  $\geq 65$  years in the community and in health care facilities (acute care, long-term care, nursing home and rehabilitation)?

Table 1 presents our initial review questions with type of studies that potentially will provide the evidence. However, it is important to note that all these four questions are directed to provide evidence to meet the aim of our study. As the review develops and evidence is gathered, these questions might be modified or develop to achieve the aim of the study.

#### *Definition of terms*

For the purpose of this review we consider the following:

Care providers: Formal, that includes registered nurses and licensed (including nursing aids, auxiliary nurses and health care assistants) and informal care providers that includes family caregivers, others caregivers other than family, friends, neighbors and paid informal unregistered caregivers.

Community: homes where older person lives, civic and community centers as well as non-institutional care settings.

Fall: 'Inadvertently coming to rest on the ground floor or other lower level, excluding intentional change in position to rest in furniture, wall or other objects' (WHO 2007, p.1).

Falls prevention interventions. The activities identified in WHO falls prevention model: awareness, assessment and intervention. Interventions will cover primary, secondary

and tertiary prevention. Hence preventive activities targeted to the general public as well as those targeted at vulnerable population will be included. The WHO preventive model is built around three pillars: (1) Developing awareness of the importance of falls prevention and treatment; (2) Enhancing the appraisal of falls' risk factors; and (3) Promoting culturally-appropriated evidence based interventions (WHO 2007). Effectiveness will be judged in initiatives or strategies that reduce falls or prevent falls as reported outcomes in the included studies.

Health care facilities: Hospital, long term care facilities, care homes, nursing homes, aged care homes, assisted, day centers, rehabilitation centers where nursing is delivered.

Strategies: a series of guidelines of action set out in a policy or program, to achieve a group of goals and targets (WHO 2011). Also, they are individuals' or groups' responses to issues, problems, or events that arise under conditions (Strauss & Corbin 1998).

## **Design**

An integrative review of qualitative, quantitative and mixed methods studies (Higgins & Green 2011, Webb & Roe 2007, Evans 2007, Whitemore 2007, Whitemore & Knafelz 2007). The integrative review is a specific review that includes diverse methodologies, summarises empirical and theoretical literature to provide a comprehensive understanding of a given phenomenon (Webb & Roe 2007). This approach 'has the potential to play a greater role in evidence-based practice for nursing' (Webb & Roe 2000, p.257). Integrative reviews are also called mixed studies reviews; there had been identified three main designs: sequential exploratory, sequential explanatory and convergent (Pluye & Hong 2014). Our protocol design is a convergent QUAL synthesis in which the quantitative and qualitative data appraisal and extraction will be simultaneous (Saldelowski *et al.* 2013, Pluye & Hong 2014) and quantitative results will be transformed into qualitative findings (Pluye & Hong 2014) to

produce a thematic synthesis. The proposed methods used will adhere to the PRISMA statement checklist (Liberati *et al* 2009, Moher *et al* 2009) complemented by the ENTREQ framework (Tong *et al.* 2012) for reporting qualitative synthesis. Both frameworks have common features and the specific items of each of them will be included into an integrated checklist. The review protocol will be registered with PROSPERO and adhere to recognised international standards of good practice. The review design is represented in Figure 1.

#### *Inclusion and exclusion criteria*

Our eligibility criteria will be based on the PICO or PECO framework (participants, interventions/exposure, comparisons, outcomes; Liberati *et al*, 2009; Moher, Liberati, Tetzlaff & Altman 2009) and on the PICo framework (population, the phenomena of interest and the context; JBI 2014). Table 2 specifies the inclusion and exclusion criteria for this study.

#### *Types of participants/population*

In this review we will include studies on all of the care providers (as specified above) that engage in programs and activities to prevent older people from falling in both the community and health care facility settings. Empirical studies including older people aged 65 years and above and empirical studies including care providers as defined above.

#### *Types of interventions/phenomena of interest*

We will include: effective fall prevention interventions that are part of established programs as well as and occasional, disparate and unrelated activities, all targeted at individuals and/or, groups of persons aged 65 and more. Studies where there is a description and interpretation of care providers' experiences and views on falls prevention and the strategies and approaches they use to prevent patients/relatives from falling. For the

description of interventions we will use the following headings: type, activities, instruments, duration, assessment, place of intervention, rationale for the intervention and agency (that is: who does what).

### *Comparisons*

For eligible comparators we will use the usual care or supportive fall preventive comparators

### *Context*

In this review we will considerer community and health care facilities according to the above definitions.

### *Types of outcomes*

The primary outcomes of interest are: the description of the intervention and the role played by care providers and their experiences and point of view. The secondary outcomes of interest are the prevention of fall in terms of: reduction of falls, reduction of the post fall syndrome, emergency room visits, hospitalizations and Injuries and deaths because fall.

### *Types of Studies*

We will include the following type of studies. Empirical studies involving qualitative designs (for instance: life histories, phenomenological studies, grounded theory and/or ethnographic studies, action research) and quantitative designs (Randomised controlled trial (RCT), or quasi-experimental study designs: non-randomised controlled trial (NRCT), controlled before-after (CBA) study and interrupted-time-series (ITS) study; or cohort study, case-control study and cross sectional study) using one methodology or mixed methods

written in languages reviewers are proficient in, English, Portuguese, Spanish and French. Reports will be considered with no restriction of country and year.

#### *Search methods for identification of studies*

We will review published material and grey literature. A systematic and exhaustive search of the literature will be conducted by a librarian expert on electronic searches combining free and controlled terms. Descriptors of data bases with thesaurus will be selected as well as key words in natural language pertaining to the study focus. The following databases will be searched: CINAHL, PUBMED/MEDLINE, EMBASE, PsycINFO, JBI, COCHRANE LIBRARY, PEDRO, WEB OF SCIENCE, OPEN GREY, CUIDEN, CUIDATGE, ENFISPO, MEDES, LILACS, TESEO, DISSERTATION ABSTRACTS AND THESIS PROCEEDINGS. Three groups of search terms (text words, MeSH and headings terms if available) will be combined: (1) fall, preventive falls... 'accidental falls,' 'fall risk,' 'risk factors,' 'risk assessment,' 'prevention falls programs', 'older people', 'elderly'; (2) experience, perception, feeling, opinion, beliefs, views, interventions; (3) role of caregivers, careers, nurses, relatives, significant others, social context. Table 2 shows the search terms that will be piloted and refined before conducting the full search. There will be no date restrictions. The limit of age groups will >65 and studies published in English, French, Portuguese and Spanish. Once the literature search is established, an automatic electronic monthly update search of each data base will be set up.

Authors have reported difficulties in locating qualitative studies (Dixon-Woods *et al.* 2001, Sandelowski & Barroso 2002) and have pointed to a lack of agreement over the indexation of the different databases as the main reason for missing relevant qualitative research papers (Wong *et al* 2004), As our search will be systematic and exhaustive, it will hopefully overcome this problem. We will perform manual search and citation search in

included primary studies and in key journals known to the reviewers and those identified during the search.

### *Study selection process*

The research team will screen independently the titles and abstracts of identified studies for possible inclusion and resolve disagreement through discussion. They will also obtain and screen independently the full text of all agreed potential studies for inclusion and they will reach an agreement for included and excluded studies. In case of disagreement a third independent reviewer will be consulted.

### *Data Extraction and Quality appraisal*

To extract data and assess studies qualities members of the research team will work in pairs concurrently according to their expertise in qualitative or quantitative methodology. The data extraction tool proposed by Joanna Briggs Institute for Evidence-Based Practice (JBI 2014) it is a standardized tool extract data from quantitative or qualitative studies (JBI-MAStARI). For quantitative studies the data extracted will include specific details about the interventions/exposures, populations, study methods and outcomes of significance to the review question and specific objectives. In addition, for qualitative studies we will include in the data JBI extraction tool data relating to author, year, study design, setting, participants (number, age, sex and occupation), study methods and findings.

Data extraction is interpretative and it is particularly so in the extraction of findings from methodologically diverse studies (Sandelowski *et al.* 2013). Reviewers will agree on what constitutes finding for this integrative review and, in the results of data extraction sheets, will take into account the proposed rules by Sandelowski *et al.* (2013) to preserve the context

of findings generation. As studies might produce more than one report, in data extraction sheets, reports from the same study will be marked as linked for the stage of synthesis. The data extraction form will be tested and refined in a sample of studies before extraction commences.

Appraising the quality of included studies is a common practice in the emerging field of mix studies reviews (Pluye & Hong 2014). We assessed the different tools to appraise the quality of studies according to their designs; and have selected the most appropriate for each type of study that we expect to review. Hence, to assess the quality of randomized studies and quasi-experimental study designs we will use the Cochrane Risk of Bias Tool (GRADE): internal validity and low risk bias through selection bias, performance bias, attrition bias and detection bias (Higgins *et al.* 2011). For case-control and cohort studies we will use the Newcastle-Ottawa Scale (NOS), which uses a 'star system' that judges on three broad areas: the selection of the groups under study; the comparability of the groups; and the establishment of the exposure or outcome of interest (Wells *et al.* 2016). For the cross-sectional studies we will use the tool developed by Berra *et al.* (2008) which assess the internal validity, the accuracy and usefulness of the results.

For qualitative studies we will use quality criteria tool that was piloted tested and implemented with success in a previous synthesis of qualitative studies by two of the researchers of the present protocol (Abad-Corpa *et al.* 2012). The tool was developed from key methodological texts and researchers' experience on appraising qualitative research. It classifies the studies in three groups: convincing, doubtful and no convincing (Abad-Corpa *et al.* 2012), based on the following criteria:

Relevance: refers to the justification and the impact of the studies for improving knowledge of the phenomenon under study.

Credibility of the findings: the capability to preserve the greatest fit with the behaviour of the phenomenon under study.

Methodological coherence: the fit of the research process with a qualitative approach or given method.

Ethical issues: reflection on the ethical implications of the research.

Qualitative studies will be also classified according to the interpretative level of the findings in three groups: interpretative, descriptive and exploratory. Quality appraising of qualitative studies does not necessarily mean that studies will be discarded due to poor quality. The tool, as it did in a previous qualitative synthesis (Abad-Corpa *et al.* 2012) will enable us to have a close look at study's relevance for the qualitative synthesis and by ascertaining the level of analysis, it will provide guidance in organizing and synthesising qualitative findings.

We will conduct a pilot to assess the viability of this guide and to evaluate the process of data collection in the assessment tools for each methodology; thus, qualitative and quantitative research teams will appraise and extract data independently.

Reviewers will undertake data extraction and quality appraisal of all included studies and they will reach agreement on the studies' appraisal. In event of discrepancies it will be considered by a third independent reviewer. In case of unclear or missing information, we will contact the corresponding author of the study.

#### *Data Synthesis*

To synthesize evidence in reviews is a challenge as methods remain underdeveloped (Popay & Roberts 2006). We will review the evidence with a multilevel syntheses approach developed in two stages.

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First, we will analyze and synthesize the included studies separately according to their study design: qualitative or quantitative. In case of mix methods designs we will assess them according to its emphasis. Quantitative studies will be synthesized descriptively with narratives, reporting study characteristics, participants' characteristics, definitions and interventions' composition, risk of bias results and frequencies of outcomes. It will be established if statistical pooling and meta-analysis is possible for similar homogeneous outcomes reported in each of the included studies. For qualitative data synthesis we will use the constant comparative strategy of grounded theory as a framework (Whittemore & Knalf 2005, Evans 2007). Concepts will be grounded on data and emerge from the synthesis. We will use Miles and Huberman's (1994) strategies for cross case analysis as recommended for synthesizing across different studies (Dixon-Woods *et al.* 2005). These strategies are consistent with grounded theory procedures. It involves coding individual reports, progressively develop categories, writing case summaries and generate data displays for comparison of each study. Second, we will bring together findings from the different study designs using thematic analysis to qualitatise quantitative data (Popay *et al.* 2006, Pluye & Hong 2014). In addition, we will explore the use of other tools and techniques suggested by Popay *et al.* (2006) to construct a common rubric for an overarching, thematic synthesis.

#### *Dissemination*

We will present and tailor the findings to the needs of different audiences. Our dissemination plans include oral presentations at national health care conferences, a journal article in the areas of gerontology and nursing and dissemination of findings at the European Innovation Partnership Action Group A2 network. We will offer an open seminar to health professionals to promote the design of falls prevention interventions in the community with family caregivers and significant others.

## **Ethical considerations.**

As this review will review findings from secondary studies no formal Research Ethics Committee approval is required.

## **Validity and reliability/rigor**

The review will follow the guidelines for integrative reviews (Higgins & Green 2011, Webb & Roe 2007, Whitemore 2007, Whitemore & Knafel 2007) and the proposed methods will adhere to the PRISMA statement checklist (Liberati *et al.* 2009, Moher *et al.* 2009) and ENTREQ framework (Tong *et al.* 2012) for reporting qualitative synthesis. We appreciate there is overlap in these statements and standards, which in our view is a strength to our proposed integrative review. As qualitative synthesis are emergent, all procedures and changes in procedure will be documented (Sandelowski & Barroso 2007).

## **DISCUSSION**

This integrative review has a constructivist drive, as in the case with mix methods designs; we believe that studies that combine methods ought to be paradigmatic driven (Morse & Niehaus 2009). Our review questions are broad to allow issues emerge, therefore are provisional and have purposefully left the design flexible to allow for adjustments as the review progresses to achieve the aim of the study. The review steps of data searching, selection, appraisal and extraction will be iterative feeding each other, this will specially be the case of reviewing qualitative studies. The steps of appraisal and extraction will be simultaneous (Sandelowski *et al.* 2013, Pluye & Hong 2014) and the synthesis will be developed in two stages.

There is no agreement on how integrative reviews should be conducted (JBI 2014). We crafted our review protocol selecting the tools we consider best fit the data extraction and

appraisal in our review for the types of studies included and research aims/questions. Tools were selected based on reviewers experience and according to the study design that to our understanding were the most feasible and comprehensive for each type of study.

Indeed, many are the methodological challenges in an integrative review. Although the inclusion of quantitative and qualitative evidence in a review promotes good and convincing evaluation of health issues (Evans 2007) it makes it complex. Indeed, the difficulty of truly integrating quantitative and qualitative findings has been long addressed in the literature pointing to the tendency of presenting findings in parallel (Bryman 2007). In this protocol we will use thematic analysis to qualitatise quantitative data (Popay *et al.* 2006) hoping to reach a thematic synthesis which is the most common data transformation technique in convergent synthesis studies (Pluye & Hong 2014). Since the most appropriate strategies for synthesising are determined by the nature of the evidence, other tools and techniques for developing a narrative synthesis proposed by Popay *et al.* (2006) will be considered to develop the thematic synthesis.

On the other hand, data collection for integrative reviews has received little attention being approached just recently by Sandelowski *et al.* (2013) who offer guidelines based on their ongoing systematic review. Evaluating qualitative research in synthesis studies is also a long standing debate where some reviewers are prone to include all the primary qualitative studies searched (Thomas & Harden 2008) and others favour to exclude those studies of poor quality (Abad-Corpa *et al.* 2012). We will assess the quality of qualitative studies as we agree with Sandelowski and Barroso (2007) on the need to appraise them as for instance, not all qualitative evidence has the same level of analysis. Acknowledging the situated nature of making judgements about the quality of a research study (de la Cuesta-Benjumea 2015) and the fact that taste it is integral to the appraising of qualitative research (Sandelowski 2014), does not imply that it is a pointless pursuit, on the contrary, we believe it has to be done but

carefully. Our evaluation criteria will be flexible as nowadays suggested for qualitative studies (Calderon 2013) and we will use an open evaluation guide. Lastly, qualitative synthesis also present challenges due to the different methodologies involved in qualitative research and the different levels of analysis. The use of an extraction form that considers context and the development a comparative and emergent analysis will address these challenges.

Finally, our protocol combines tools from different approaches, something unusual in systematic reviews. Since we are not conducting a Cochrane or JBI review but an integrative review, we consider, after assessment, that the different tools can be used in a combined manner and the review methods proposed are systematic and follow established guidelines.

### **Limitations**

The variability of the quality of the studies reviewed might make the synthesis of results difficult. The incipient development of synthesizing integrative reviews might limit the results of this study. Identifying and accessing studies published in journals with limited dissemination might not be sufficient even by hand searching.

Some review methodologists may contest the blended approach to evidence synthesis techniques and use of tools we propose. However, as this is an integrative review we purposefully selected the strongest most established and internationally recognised techniques, albeit from institutions with varying methods and ideologies, for evidence synthesis of quantitative, qualitative and mixed methods evidence and empirical studies. As such our approach is novel.

## CONCLUSION

Falls' prevention strategies have been the focus of much research in the area of falls. Key recommendations from evidence regarding best practices falls risk assessment and prevention in the community involve health care professionals such as family doctors, nurses, occupational therapists and physiotherapists (Lonergan & Moloney 2014). The findings of this review will highlight the roles that care providers play in fall prevention and their views on fall's prevention initiatives. It will hopefully provide relevant information to contribute to the implementation of falls prevention programs. Thus, results will uncover potential as well as areas of weakness helping to traget policies to care providers promoting their engagement in preventing falls among older prople. Systematic reviews gather evidence required for policy making and this evidence has to be interpreted in context with local evidence (Lewin *et al.* 2009). However, local evidence it is not only bound to geographical scenarios, but includes social contexts, views and experiences of relatives and caregivers (de la Cuesta-Benjumea & Roe 2015).

Lastly, by searching studies published in other languages than English, this integrative review has the potential to integrate publications from geographical areas that, because of language barriers, have tended to be excluded from reviews and will provide important cultural context and comparison. Because there are few examples in the literature as how to integrate qualitative findings in systematic reviews (Harden 2006); we hope that this study will contribute to this.

### Author Contributions:

All authors have agreed on the final version and meet at least one of the following criteria (recommended by the ICMJE\*):

1) substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data;

2) drafting the article or revising it critically for important intellectual content.

\* <http://www.icmje.org/recommendations/>

### References

Abad-Corpa, E., Gonzalez-Gil, T., Martínez-Hernández, A., Barderas-Manchado, A. M., De la Cuesta-Benjumea, C., Monistrol-Ruano, O., Mahtani-Chugani, V. & RETICEF evidencia Group. (2012). Caring to achieve the maximum independence possible: a synthesis of qualitative evidence on older adults' adaptation to dependency. *Journal of Clinical Nursing*, 21, 3153–3169.

Akyol, A. D. (2007). Falls in the elderly; what can be done? *International Nursing Review*, 191-196.

Berra, S., Elorza-Ricart, J. M., Estrada, M. D., & Sanchez, E. (2008). [A tool for the critical appraisal of epidemiological cross-sectional studies]. *Gaceta sanitaria / S.E.S.P.A.S*, 22(5), 492-497.

Bleijlevens, M. H. C., Hendriks, M. R. C., van Haastregt, J. C. M., van Rossum, E., Kempen, G. I. J. M., Diederiks, J. P. M., Crebolder, H. F. J. M. & van Eijk, T. H. M. (2008). Process

factors explaining the ineffectiveness of multidisciplinary fall prevention programme: A process evaluation. *BMC Public Health*, 8, 332 available in :<http://www.biomedcentral.com/1471-2458/8/332> (Accessed 05/05/2012).

Calderón, C. (2013). Researcher reflections. In Baden, M. S. & Major, C. H. (Eds.) *Qualitative Research. The essential guide to theory and any practice* (p.481). London: Routledge.

Cameron, I. D., Gillespie, L. D., Robertson, M. C., Murray, G. R., Hill, K. D., Cumming, R. G., & Kerse, N. (2012). Interventions for preventing falls in older people in care facilities and hospitals. *Cochrane summaries*, Available in: <http://summaries.cochrane.org/CD005465> DOI:10.1002/14651858.CD005465 (Accessed 12/01/2015).

Campbell, A. J., Borrie, M. J., Spears, G. F., Jackson, S. L., Brown, J. S., & Fitzgerald, J. L. (1990). Circumstances and consequences of falls experienced by a community population 70 years and over during a prospective study. *Age and Ageing*, 19, 134-41.

COM (2012). Communication from the commission to the European Parliament and the Council. *Taking forward the Strategic Implementation Plan of the European Innovation Partnership on Active and Healthy Ageing* Available in: <http://eur-ex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:52012DC0083:EN:NOT>.(Accessed: 12/11/2012)

Currie, L. (2008). Fall and injury prevention. In Hughes, R. G. (ed.). *Patient Safety and Quality: An Evidence-Based. Handbook for Nurses*. Rockville: AHRQ Publication No. 08-0043 in: <http://www.ahrq.gov/qual/nurseshdbk/docs/CurrieLFIP.pdf>. (Accessed 08/04/ 2014).

Day, L., Finch, C. F., Hill, K. D., Haines, T. P., Clemson, L., Thomas, M. & Thompson, C. (2011). A protocol for evidence-based targeting and evaluation of statewide strategies for

preventing falls among community-dwelling older people in Victoria, Australia. *Injury*

*Prevention* 17: e3 doi: 10.1136/ip.2010.030775

Deandrea, S., Bravi, F., Turati, F., Lucenteforte, E., La Vecchia, C., & Negri, E. (2013). Risk factors for falls in older people in nursing homes and hospitals. A systematic review and meta-analysis. *Archives of Gerontology and Geriatrics*, 56, 407-415.

Deandrea, S., Lucenteforte, E., Bravi, F., Foschi, R., La Vecchia, C., & Negri, E. (2010). Risk Factors for Falls in Community-dwelling Older People: A Systematic Review and Meta-analysis. *Epidemiology*, 21, 658-668.

De la Cuesta-Benjumea, C. (2015). The quality of qualitative research: from evaluation to attainment. *Texto Contexto Enferm.* 24 (3), 883-90.

Dixon-Woods, M., Fitzpatrick, R., Roberts, K. (2001). Including qualitative research in systematic reviews: opportunities and problems. *J Eval Clin Pract*, 7(2),125-33.

Dixon-Woods, M., Agarwal, S., Jones, D., Young, B. & Sutton, A. (2005). Synthesising qualitative and quantitative evidence: a review of possible methods. *Journal of Health Services Research*, 10 (1), 45-53

Dorresteijn, T. A., Zijlstra, G. A. R, Ambergen, A. W., Delbaere, K., Vlaeyen, J. W. & Kempen, G. I. J. (2016). Effectiveness of home-based cognitive behavioural program to manage concerns about falls in community-dwelling, frail older people: results of a randomized controlled trial. *BMC Geriatrics*, 16. DOI 10.1186/s12877-015-0177-y

Evans, D. (2007). Overview of methods. In Webb, C. & Roe, B. (Eds.) *Reviewing Research Evidence for Nursing Practice: Systematic Reviews*, (pp. 137-148) Oxford, UK: Blackwell Publishing.

European Commission (2012). *Horizon 2020-The EU framework programme for research and innovation*. Available at: <https://ec.europa.eu/programmes/horizon2020/en> (Accessed 05/02/2014)

European Innovation Partnership on Active and Healthy Ageing (EIP) (2012). *Action Plan 2*. Available at: [http://ec.europa.eu/research/innovation-union/pdf/active-healthy-ageing/a2\\_action\\_plan.pdf#view=fit&pagemode=none](http://ec.europa.eu/research/innovation-union/pdf/active-healthy-ageing/a2_action_plan.pdf#view=fit&pagemode=none) (Accessed 12/11/ 2012).

Euro Safe, (2014). *Injuries in the European Union, Report on injury statistics 2010-2012*. Amsterdam: European Union.

Gillespie, L. D., Robertson, M. C., Gillespie, W. J., Sherrington, C., Gates, S., Clemson, L. M. & Lamb, S. E. (2012). *Interventions for preventing falls in older people living in the community*. Cochrane summaries. Published on line: November 14, 2012. Available: <http://summaries.cochrane.org/CD007146> (Accessed 07/01/2013).

Goodwin, V. A., Abbott, R.A., Whear, R., Bethel, A., Ukoumunne, O. C., Thompson-Coon, J., & Ken Stein K.. (2014). Multiple component interventions for preventing falls and fall-related injuries among older people: systematic review and meta-analysis. *BMC Geriatrics*, 14, 15. Available at: <http://www.biomedcentral.com/1471-2318/14/15> (Accessed 28/11/2014).

Graham, B. C. (2012). Examining evidence-based interventions to prevent inpatient falls. *MedSurg Nursing*, 21, 267-70.

Harden, A. (2006). Extending the boundaries of systematic reviews to integrate different types of study: examples of methods developed within reviews on young people's health. In Popay, J. (ed.). *Moving beyond effectiveness in evidence synthesis*. (pp. 31-40). London: National Institute for Health and Clinical Excellence.

Hawley-Hague, H., Horne, M., Campbell, M., Demack, S. & Skelton, D. A. (2014). Multiple levels of influence on older adults' attendance and adherence to community exercise classes.

*The Gerontologist*, 54, 599-610.

Higgins, J., & Green, S. (2011). *Cochrane Handbook for Systematic Reviews of Interventions, Version 5.1.0*. The Cochrane Collaboration. Available at: <http://www.cochrane-handbook.org>

Higgins, J. P. T., Altman, D. G., Gotzsche, P. C., Juni, P., Moher, D., Oxman, A. D., Sterne, J. A. C. (2011). The Cochrane Collaboration's tool for assessing risk of bias in randomised trials. *BMJ*.343:d5928

Horton, K. & Arber, S. (2004). Gender and the negotiation between older people and their careers in the prevention of falls. *Ageing and Society* 24, (1), 75-94.

JBI (2014). *Joanna Briggs Institute Reviewers' Manual:2014 edition*. South Australia: JBI.

Lewin, S., Oxman, A. D., Lavis, J. N., Fretheim, A., Garcia-Marti, S. & Munabi-Babigumira, S. (2009). Support tools for evidence-informed Policymaking in health 11: Finding and using evidence about local conditions. *Health Research Policy and Systems* 7 (Suppl 1) SII doi: 10.1186/1478-4505-7-SI-SII.

Lamb, S. E., Becker, C., Gillespie, L. D., Smith, J. L., Finnegan, S., Potter, R., & Pfeiffer, K. (2011). Reporting of complex interventions in clinical trials:development of a taxonomy to classify and describe fall-prevention interventions. *Trial*, 12, 125. Available: <http://www.trialsjournal.com/content/12/1/125> (Accessed 28/11/2014).

Liberati, A., Altman, D.G., Tetzlaff, J., Mulrow, C., Gøtzsche, P.C., Ioannidis, J.P., (et al.) (2009) The PRISMA Statement for Reporting Systematic Reviews and Meta-Analyses of

Studies That Evaluate Health Care Interventions: Explanation and Elaboration. *PLoS Med.* 6 (7):e1000100. PMID: 19621070.

Liddle, J. & Gilleard, C. (1995). The emotional consequences of falls for older people and their families. *Clin Rehabil*, 9, 110-114

Lonergan, H. & Moloney, C. (2014). Assessing the risk of falls among community dwelling older adults: a best practice implementation project. *JBIC Database of Systematic Reviews & Implementation Reports*, 12, 364-393.

McInnes, E. & Askie, L. (2004). Evidence Review on Older People's Views and Experiences of Falls Prevention Strategies. *Worldviews on Evidence-Based Nursing*, 1, 20-37.

McInnes, E., Seers, K. & Tutton, L. (2011). Older people's views in relation to risk of falling and need for intervention: a meta-ethnography. *Journal of Advanced Nursing* 67, 2525-2536.

Miles, M.B. & Huberman, M. (1994). *Qualitative data analysis: an expanded sourcebook*. London: SAGE.

Moore, G. F., Audrey, S., Barker, M., Bond, L., Bonell, C., Hardeman, W.(et al.) (2015). Process evaluation of complex interventions: Medical Research Council guidance. *BMJ* 350:h1258 | doi: 10.1136/bmj.h1258

National Safety Council (2014). National Safety Council Joins U.S. Consumer Product Safety Commission to Reduce Elderly Falls and Injuries .Sharp Increase in Falls Among the Elderly a Priority Issue for Both Organizations. Available: <http://www.nsc.org/Pages/NationalSafetyCouncilJoinsUSConsumerProductSafetyCommissiontoReduceElderlyFallsandInjuries.aspx> (Accessed 12/01/2015)

Moher, D., Liberati, A., Tetzlaff, J., Altman, D.G. (2009). The PRISMA Group. Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. *PLoS Med.*, 6(7):e1000097. PMID: 19621072.

Morse, J. & Niehaus, L. (2009). *Mix Method design. Principles and procedures*. Walnut Creek, CA.; Left Coast Press.

Popay, J. & Roberts, H. (2006). Introduction: methodological issues in the synthesis of diverse sources of evidence. In Popay, J. (Ed.) *Moving beyond effectiveness in evidence synthesis* (pp. 1-4). London: National Institute for Health and Clinical Excellence.

Popay, J., Roberts, H., Sowden, A., Petticrew, M., Arai, L., Rodgers, M.(et al.) (2015). *Complex Interventions in Health: An overview of research methods*. London: Routledge

Pluye, P. & Hong, Q. N. (2014). Combining the power of stories and the power of numbers: mix methods research and mix studies reviews. *Annu. Rev. Public Health*, 35, 29-45.

Roen, K. & Duffy, S. (2006). *Guidance on the Conduct of Narrative Synthesis in Systematic Reviews*. Available at

<http://www.lancs.ac.uk/shm/research/nssr/research/dissemination/publications.php> (Accessed 10/01/2014).

Ralph, M. & Gabriele, M. (2014). Attitudes of nurses towards the use of physical restraints in geriatric care: A systematic review of qualitative and quantitative studies. *International Journal of Nursing Studies*, 51, 247-288.

Roe, B., Howell, F., Riniotis, K., Beech, R., Crome, P. & Ong, B. N. (2009). Older people and falls: health status, quality of life, lifestyle, care networks, prevention and views on service use following a recent fall. *Journal of Clinical Nursing*, **18**, (16), 2261-2272.

Ruchinskas, R. (2003). Clinical prediction of falls in the elderly. *Journal of Physical Medicine and Rehabilitation*, **82**, 273-278.

Sandelowski, M. (2014). A matter of taste: evaluating the quality of qualitative research. *Nursing Inquiry*, **22** (2), 86-94

Sandelowski, M. & Barroso, J. (2002). Finding the findings in qualitative studies. *J Nurs Scholarsh*, **34**(3), 213-9.

Sandelowski, M. & Barroso, J. (2007). *Handbook for synthesizing qualitative research*. New York: Springer.

Sandelowski, M., Leeman, J. , Knalfl, K. & Crandell, J . L . ( 2013). Text in-context: a method for extracting findings in mixed-methods mixed research synthesis studies. *Journal of Advanced Nursing*, **69**(6), 1428–1437

Salkeld, G., Cameron, I. D., Cummings, R. G., Easter, S., Seymour, J., Kurrle, S. E. & Quine, S. (2000). Quality of life related to fear of falling and hip fracture in older women: a time trade off study. *British Medical Journal*, **320**, 341-345.

Sampson, M., McGowan, J., Cogo, E., Grimshaw, J., Moher, D., & Lefebvre, C. (2009). An evidence-based practice guideline for the peer review of electronic search strategies. *Journal of Clinical Epidemiology*, **62**, 944-952.

Shaw, J. A., Connelly, D. M. & McWilliam, C. L. (2014). Enacting Fall Prevention in Community Outreach Care. *Qualitative Health Research*, **24**, 901-912.

Strauss, A. L. & Corbin, J. (1998). *Basics of qualitative research* (2<sup>nd</sup> Ed.). Thousand Oaks, CA: SAGE.

Thomas, J. & Harden, A. (2008). Methods for the thematic synthesis of qualitative research in systematic reviews. *BMC Medical Research Methodology* ,8:45 Available at: <http://www.biomedcentral.com/1471-2288/8/45> (Accessed 28/01/2016).

Todd, C. & Skelton, D. (2004). *What are the main risk factors for falls among older people and what are the most effective interventions to prevent these falls?* Copenhagen: WHO Regional Office for Europe (Health Evidence Network report) Available: <http://www.euro.who.int/document/E82552.pdf> (Accessed 5 October 2011).

Tong, A., Flemming, K., McInnes, E., Oliver, S. & Craig, J. (2012). Enhancing transparency in reporting the synthesis of qualitative research. ENTREQ. *BMC Medical Research Methodology* 12:181 Available at: <http://bmcmedresmethodol.biomedcentral.com/articles/10.1186/1471-2288-12-181> (Accessed 8 July 2016).

Yardley, L., Bishop, F. L., Beyer, N., Hauer, K., Kempen, G. I. J. M., Piot-Ziegler, C.(et al.) (2006). Older people's views of falls-prevention interventions in six European countries. *The Gerontologist* 46, 650-660.

Webb, C. & Roe, B. (2007). *Reviewing research evidence for nursing practice:systematic reviews*. Oxford: Blackwell Publishing.

Webb, C. & Roe, B. (2007). Reflections on the past, present and future of systematic reviews. In Webb, C. & Roe, B. (Eds.) *Reviewing research evidence for nursing practice: systematic reviews* (pp. 254-260). Oxford: Blackwell Publishing.

Weeks, L. E. & Roberto, K. A. (2002). Empowering older women to address falls prevention. *Quality in Ageing*, 4, 5-13.

Wells, G., Shea, B., O'Connell, D., Peterson, J., Welch, V., Losos, M. & Tugwell, P. *The Newcastle-Ottawa Scale (NOS) for assessing the quality of nonrandomised studies in meta-analyses*. Available: [http://www.ohri.ca/programs/clinical\\_epidemiology/oxford.asp](http://www.ohri.ca/programs/clinical_epidemiology/oxford.asp) (Accessed 29 February 2016)

WHO(2007). *WHO global report on falls prevention in older age*. Geneva: WHO.

WHO (2011). *Health Systems Strengthening. Glossary*. Geneva: WHO. Available:[http://www.who.int/healthsystems/Glossary\\_January2011.pdf](http://www.who.int/healthsystems/Glossary_January2011.pdf) (Accessed 4/09/14)

WHO (2015). *European Strategic Directions for Strengthening Nursing and Midwifery Towards Health 2020 Goals*. Available at: [http://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0004/274306/European-strategic-directions-strengthening-nursing-midwifery-Health2020\\_en-REV1.pdf?ua=1](http://www.euro.who.int/__data/assets/pdf_file/0004/274306/European-strategic-directions-strengthening-nursing-midwifery-Health2020_en-REV1.pdf?ua=1) (Accessed 20/01/2015)

Wong, S.S., Wilczynski, N.L., Haynes, R., Hedges, T. Developing optimal search strategies for detecting clinically relevant qualitative studies in MEDLINE. *Stud Health Technol Inform.* 2004, 107(Pt 1):311-6.

Zijlstra, G. A. R., van Haastregt, J. C. M., du Moulin, M. F. M. T., de Jonge, M. C. , van der Poel, A. & Kempen, G. I. J. M. (2012). Effects of the implementation of an evidence-based program to manage concerns about falls in older adults. *The Gerontologist*, 53, 839-849.

## Review questions

-What is the role of nursing and caregivers in falls prevention in older adult's aged  $\geq 65$  years in the community and in health care facilities (acute care, long-term care, nursing home and rehabilitation)?

- What are the activities that nurses, nursing aids, auxiliary nurses, and health care assistants, informal and family caregivers engage in to prevent older people from falling?
- How do they implement fall prevention strategies?
- What approaches do they use to prevent their patients or relatives from falling?

-What are care providers' points of view about falls' prevention programs and initiatives?

-What are the differences and similarities of nursing interventions in the community and in health care facilities (acute care, long-term care, nursing home and rehabilitation) to prevent older people from falling?

## Type of studies where evidence might be found

### Quantitative studies

Randomized Control Trials (RCT)

Quasi-experimental

Observational studies

### Qualitative studies

Life histories

Phenomenological studies

Grounded theory and/or ethnographic studies

Narratives, content/thematic analysis

Generic qualitative studies

Action research

### Qualitative studies

Life histories

Phenomenological studies

Grounded theory and/or ethnographic studies

Narratives, content/thematic analysis

Generic qualitative studies

Action research

### Quantitative studies

Randomized Control Trials (RCT)

Quasi-experimental

Observational studies

### Qualitative studies

Life histories

-What is the effectiveness of nursing interventions in falls prevention in older adults' aged  $\geq 65$  years in the community and in health care facilities (acute care, long-term care, nursing home and rehabilitation)?

Phenomenological studies

Grounded theory and/or ethnographic studies

Narratives, content/thematic analysis

Generic qualitative studies

Action research

**Quantitative studies**

Randomized Control Trials (RCT)

Quasi-experimental

Observational studies

Table 1 Review questions and possible sources of evidence

Table 2 Selection Criteria

INCLUSION CRITERIA	EXCLUSION CRITERIA
Full text research papers in English, French Portuguese and Spanish	Theoretical papers
Primary studies	Secondary studies
Studies about falls prevention in the community and health care facilities	Reports that do not stated where the falls prevention activity takes place or/nor who implemented it.
	Studies on falls prevention of people aged <65
Studies that meet the quality criteria	

Figure 1: Review design

