


# BMJ Open Home-modification interventions addressing falls and participation in activities of daily living among older adults: a scoping review protocol

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## ABSTRACT

**Introduction** Falls are the second leading reason for incidental or unexpected deaths worldwide. Many older adults who fall, regardless of whether they are injured or not, tend to experience fear of fall and this can lead to decreased participation in activities of daily living (ADLs). Subsequent falls lead to weakness, a decline in physical functioning, increased chances of falling and a negative impact on the instrumental ADLs. Here, we present our scoping review protocol to appraise the literature to describe and explain the home-modification interventions used by occupational therapists to address falls and participation in ADLs among community-dwelling older adults. We are aiming to review the available home-modification intervention protocols, facilitators and barriers to such interventions, and the experiences of occupational therapists and clients after receiving these interventions.

**Methods and analysis** This scoping review protocol follows existing guidelines for scoping reviews with a particular attention on Arksey and O'Malley (2005) and Colquhoun *et al* (2014). We will include the following databases: Scopus, Web of Science, PubMed, ProQuest, Cumulative Index to Nursing and Allied Health Literature and Google Scholar. We plan to conduct the literature search from August 16, 2020 to September 15, 2020. Two reviewers will independently screen eligible studies for inclusion. We will extract the bibliographic data, study design, details of the intervention provided, outcomes and experiences of occupational therapists and clients, and further organise them for better understanding.

**Ethics and dissemination** As secondary data analysis, this scoping review does not require ethics approval. Results will summarise and disseminate the existing literature related to home-modification interventions provided by occupational therapists addressing falls and participation in ADLs among community-dwelling older adults. We plan to disseminate the results through peer-reviewed journals and conferences, targeting occupational therapists, other rehabilitation workers, researchers and policy makers.

## INTRODUCTION

As people age, they experience a considerable decline in functional abilities. Older adults are prone to multiple debilitating

## Strengths and limitations of this study

- The breadth of home-modification interventions addressing falls and improving activity of daily living participation make the scoping review a useful research methodology.
- The study uses a rigorous methodological framework.
- This will include recent articles from multiple databases.
- We may fail to gather data from other professional backgrounds, which would have addressed similar concerns.

chronic conditions that increase their vulnerability to falls. By 2050, the number of people over 65 years will increase from one in eleven to one in six,<sup>1</sup> thereby increasing the number of falls in older adults. A fall is an event that results in a person coming to rest inadvertently on the ground, or floor, or other lower levels.<sup>2</sup> Falls are the second leading reason for incidental or unexpected deaths worldwide.<sup>2</sup> Annually across the globe, there were around 646 000 deaths caused due to falls, of which 80% were in low-income and middle-income countries.<sup>2</sup> Falls are the prevalent cause of head injuries and fractures of the wrist, arms, legs and hips. Annually a minimum of 300 000 older adults seek medical help for hip fracture, out of which 95% are caused by falling.<sup>3</sup> In year 2015, in the USA, the total medical expenses due to falls accounted for more than \$50 billion. Many older adults who fall, regardless of whether they are not injured, tend to experience fear of fall and thus leading to decreased participation in everyday ADLs.<sup>3–5</sup> A fall subsequently leads to weakness, a decline in physical functioning, and further chances of falling<sup>3</sup> and negative impact on the Basic ADLs and Instrumental ADLs.<sup>4 5</sup> The consequences of accidental

falls can worsen the quality of life, resulting in increased medical expenses, dependency and early admission to a helped living or long term care.<sup>2</sup> Therefore, falls among community-dwelling older adults are a significant public health issue worldwide. Management of falls should focus on creating a safer environment, education, training, research and establishing policies to reduce the risk of falls.<sup>2</sup>

Home modifications are defined as the changes made to adapt living spaces to increase usage, safety, security and independence.<sup>6,7</sup> For this review, we will include the studies that involve any minor or significant modification in the built environment of the client's home. Occupational therapy as a profession provides strategies to modify the home environment considering the individual's abilities and enables participation in all meaningful occupations of daily living. Home modifications play as an essential factor in allowing individuals to 'age in place'. Occupational therapists provide client-centred, context-specific interventions to adapt the living environment to the older adults for fall prevention, and health promotion, thus increasing the quality of life.<sup>7</sup> Some examples of home modifications are installing grab bars in the toilet, installing ramps and expanding the door width.

ADLs are the actions oriented toward taking care of one's own body, such as bathing, showering, toileting, dressing, swallowing/eating, feeding, functional mobility, personal device care, personal hygiene and grooming and sexual activity.<sup>8</sup> For this review, we will include any study focusing on one or more of the ADLs.

The available literature about the effect of environmental modification intervention and role of occupational therapists for fall prevention<sup>9,10</sup> emphasised the use of a multimodal approach, including the use of physical therapy and medical management in addition to occupational therapy and also recommended further research in this field. In a systematic review<sup>11</sup> of the effect of home modification and fall prevention programs on falls and performance in community-dwelling older adults, the authors emphasised the need for further research on the impact of home modifications on fall prevention and performance in all areas of occupation. Previous studies convey that older adults with a history of falls have a higher chance of recurrence. It impacts their participation in ADLs, which can be addressed through home-modification interventions.<sup>3</sup> To update the knowledge on the available home-modification interventions addressing falls and participation in ADLs, there is a need to follow through the review. This review will guide the current occupational therapy practice, examine the extent of research and will help to identify the gaps in the existing literature.

## METHODS

Due to the diversity of the existing literature, we propose a scoping review design to achieve our aim.<sup>12,13</sup> A scoping review is a form of evidence synthesis that addresses on

an exploratory research question rather than a highly focused question as in systematic review.<sup>5</sup> It aims to map critical concepts, types of evidence and gaps in research related to defining areas by systematically searching, selecting and synthesising existing knowledge.<sup>11,13,14</sup>

This scoping review protocol follows a scoping review framework<sup>12,14</sup> and guidelines for scoping reviews in occupational therapy.<sup>15</sup> We will follow the five stages as follows:

Stage 1: identifying the research question.

Stage 2: searching for relevant studies.

Stage 3: selection of studies.

Stage 4: charting the data.

Stage 5: collating, summarising and reporting the results.

### Stage 1: identifying the research question

A constant process of refining the research question as a team was followed to generate the research question. To facilitate a comprehensive review of the literature, a somewhat broad question was required. Based on the terminology, current trends and our understanding of home-modification interventions addressing falls and participation in ADL, we finalised the following research question:

What are the various home-modification interventions used by occupational therapists that address the frequency of falls and participation in ADLs among community-dwelling older adults?

Subsequently, the following aim and objectives were identified:

#### Aim

To review and appraise the methodology of home-modification interventions, facilitators and barriers for occupational therapists, experiences of clients utilising these interventions.

#### Objectives

- ▶ To identify existing research that utilised home-modification interventions addressing falls and participation in ADLs among older adults.
- ▶ To describe the methods of research related to home-modification interventions.
- ▶ To identify any facilitators and barriers for occupational therapists in implementing these interventions.
- ▶ To determine potential areas for further application of these concepts in occupational therapy practice.

### Stage 2: identifying relevant studies

Although the aim of the scoping review can be broad, parameters must still be selected to guide the search strategy.<sup>5</sup> With the help of a subject expert, the first and corresponding author developed provisional eligibility criteria, exclusion criteria and identified databases to be searched.

#### Selection criteria

The literature search will use the following inclusion criteria to guide the identification of articles to be

reviewed. For this scoping review, we will consider home modification as interventions that are targeted to adapt living spaces of older adults to increase usage, safety, security and independence.<sup>6,7</sup>

- ▶ We will consider intervention as well as observation studies that have assessed or observed the effectiveness or association of home-modification intervention on prevention or control of falls among older adults and participation in ADLs.
- ▶ Articles having at least one author as an occupational therapist will be included as we plan to include interventions that are designed or implemented only by an occupational therapist.
- ▶ We will include studies involving any older adults who are living in the community, aged 60 and above.
- ▶ Studies from any country.
- ▶ The literature published in the last two decades (January 2001–September 2020).
- ▶ Studies using both quantitative and qualitative study designs.
- ▶ We will exclude the mixed population if there is no subgroup available for older adults. Outcomes of our interest are participation in ADLs, frequency of falls, facilitators and barriers for interventions and experiences of clients.

### Databases

The following databases will be searched: Scopus, Web of Science, PubMed, ProQuest, Cumulative Index to Nursing and Allied Health Literature. These databases were selected to capture a comprehensive sample of the literature.

### Search strategy

The search strategy was formulated during the development of the provisional eligibility criteria of the scoping review. We focused on home-modification intervention/falls/ADLs/older adults with operational search terms. The first and last authors (GMG and SM), together with a research officer, in a repeated process, developed a list of primary and secondary search terms with acceptable filters. The initial search terms focused on concepts of home modification, falls and ADLs. The secondary terms included broader terms of experiences, facilitators and barriers. The primary filter will be kept for date range, which is within the last 20 years (2001–2020). All the search strategies will be modified to comply with the different databases we will search. The suggested Boolean phrases, Medical Subject Headings (MeSH) terms and filters are listed below (table 1).

### Stage 3: study selection

This scoping review will follow a three-step article selection process. Article titles will be reviewed first, and two reviewers (AU and GMG) will blindly review all captured titles and abstracts to determine its eligibility for selection in the review. In any disagreement, a third reviewer (PND) will be approached. However, where there is uncertainty

**Table 1** General search strategy

Keyword	Alternative words
Accidental falls	Falls OR Falling OR Slip
Activities of daily living	ADL OR Daily living activities OR Living activities
Older adults	Elderly, frail OR Frail elders OR Functionally impaired elderly OR Frail older adults OR Older adult OR Aged
Environment design	Design, environment OR Designs, Environment OR Environment designs OR Healthy places OR Healthy place
Occupational therapy	Occupational rehabilitation

ADL, Activity of daily living.

about the title, especially about the focus of research, the article will not be eliminated until it is examined in more depth in stage 2.

In stage 2 of article selection, the third and fourth author (PND and NKT) will screen the abstract of articles included from step 1 using the inclusion and exclusion criteria. Any differences arising between the two reviewers will be resolved with the help of the third reviewer (GMG). What is vital in our scoping review is to include the abstracts that demonstrate the subject area that is home-modification addressing falls and participation in ADLs among community-dwelling older adults.

In the third stage, the two independent reviewers (GMG and AU) will each screen the full-text articles to determine if they meet the inclusion/exclusion criteria. Any disagreement will be resolved through discussion with a third reviewer (SM) until a full consensus is achieved.

### Stage 4: charting the data

We will extract the key information about the study using the framework designed (table 2). Study objectives will guide us to develop categories in data and organise it. It will ensure that the authors collect standard information to disseminate the findings in a concise format.

### Stage 5: collation, summarising and reporting the results

This scoping review will present a narrative summary of the study findings in two ways. First, a numerical analysis of the bibliometric information will be presented. This will describe the extent, nature and distribution of studies through tables and charts mapping the bibliometric information, design of the study, study identifiers and year of publication. We will abstract details of population, details of intervention or exposure and findings. Second, the extracted key ideas from qualitative studies will be thematically organised to different groups. With this, we aim to summarise the experiences of clients and occupational therapists. The development of a framework to present the summary will be a repetitive process that will emerge as we examine the studies.

**Table 2** Framework for data extraction

Bibliometric information	Characteristics of the study	Proposed categories of data
<ul style="list-style-type: none"> <li>▶ Title of the study</li> <li>▶ Authors</li> <li>▶ Source/Journal</li> <li>▶ Year of publication</li> <li>▶ Country</li> <li>▶ Affiliation of the author</li> <li>▶ Type of study</li> </ul>	<ul style="list-style-type: none"> <li>▶ Research Question/aim(s)</li> <li>▶ Objectives(s)</li> <li>▶ Intervention(s)</li> <li>▶ Outcome(s)</li> <li>▶ Patient population</li> <li>▶ Key findings</li> </ul>	<ul style="list-style-type: none"> <li>▶ Description of home-modification intervention</li> <li>▶ Facilitators and barriers to intervention</li> <li>▶ Experiences of clients undergone intervention</li> </ul>

## DISCUSSION

To our knowledge, this scoping review, which examines the concepts of fall prevention and participation in ADLs, is first of its kind. This review has the potential to improve the understanding of occupational therapists practicing with older adults. In this review, we aim to review and appraise the home-modification interventions addressing falls and ADL participation among older adults, facilitators and barriers to interventions, experiences of occupational therapists and clients receiving the intervention. This will give us a better understanding, which will inform further research, practice and training.

## Ethics and dissemination

As a secondary analysis, this scoping review does not require ethics approval. Results will summarise existing research related to home-modification interventions for fall prevention and ADLs among community-dwelling older adults. It will describe various interventions used by occupational therapists in community settings. We will disseminate the results through peer-reviewed journals and conferences targeting clinicians, academics and researchers.

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