

# Evidence Based Practice Review

## Self-assessment tools of person-environment fit

**PEER  
REVIEWED**

Authored By  
Home Modification Information Clearinghouse

**1st ed. December 2020**

DOI: 10.26288/5fec08907af77

ISBN: 978-0-7334-3953-7

Evidence Based Research Series

ISBN: 978-0-7334-3663-5



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## Abstract

**Background:** Older people and people with a disability are more likely to have difficulty managing in the home when compared to people without age or ability related impairment. Assessments of their function as well as of their home environment can lead to the prescription of home modifications and/or assistive technology that can improve their quality of life in the home. During periods of self-isolation and physical distancing, self-assessment tools can prove valuable for the preservation of the health of the tenants as well as the health professionals.

**Objectives:** To explore and determine the existing self-assessment tools or the tools that can be transformed into self-assessment tools of functional ability and the appropriateness of the home.

**Search Methods:** Systematic research through the HMInfo Library, Google Scholar and Standard Electronic Databases to retrieve 36 publications.

**Data Collection and analysis:** 8 studies were analysed and included in the review.

**Results:** Only one tool (CASPAR) was found to fulfil all requirements for a self-assessment tool of the person-home fit. A Telehealth version of the tool seems to be more effective in providing the necessary information for Occupational Therapists to be able to prescribe home modifications.

**Authors Conclusions:** A self-assessment tool for the person-home environment fit should be developed and scientifically tested, utilizing existing tools elements.

## Keywords

**Functional ability, home assessment, person-environment fit, self-assessment tools, older people, people with disability, home modifications**

## Publication History

1st edition, Self-assessment tools of the person-environment fit by the Home Modification Information Clearinghouse, December 2020.

## Contribution of Authors

This is the 1st edition of Evidence Based Practice Review: Self-assessment tools of the person-environment fit, (2020) for the Home Modification Information Clearinghouse, UNSW Sydney.

Konstantina Vasilakopoulou collected the data, contributed to the data and analysis tools, performed the analysis, and wrote the paper. Prof. Catherine Bridge contributed to the analysis tools and provided editing and structural input.

## Acknowledgements

This material has been published by the Home Modification Information Clearinghouse (HMinfo) within the faculty of Built Environment, UNSW Sydney (University of New South Wales).

This material was produced with funding from the Australian Government Department of Health and the NSW Department of Family and Community Services.

HMinfo have a policy of undertaking a review process prior to the publication of research documents. The reviews are performed by Specialist Review Panels in accordance with the HMinfo Specialist Review Panel: Terms of Reference, available at the HMinfo website: [www.homemods.info](http://www.homemods.info).

The following Specialist Review Panel members provided their expertise and feedback for this document:

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Home Modification Information Clearinghouse (2020), Evidence Based Practice Review: Self-assessment tools of the person-environment fit. Sydney: Home Modification Information Clearinghouse, UNSW Sydney. (December) [online]. DOI: 10.26288/5fec08907af77

Available from HMinfo website: [www.homemods.info](http://www.homemods.info)

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## Background

### Functional ability and ageing in place

In Australia, 12% of the people who are younger than 65 have a disability and this percentage rises to 50% for people over 65 (AIHW, 2020). Even for those who live without a disability, functional ability is significantly reduced with age. When the functional ability of an individual is reduced, performing essential daily tasks without assistance can be difficult or even impossible.

Reduced functional ability and the increased probability of falls are the two most common reasons interfering with a person's independence and leading to institutionalization (Ambrose, Paul and Hausdorff, 2013). However, people generally prefer to remain and age at their homes rather than moving to residential aged care facilities (Boldy *et al.*, 2011). It is expected that after the COVID-19 outbreak, the percentage of people that would prefer to remain at home will have increased, even though there is no research evidence to support that claim yet.

Even though people prefer to stay at their homes as they age, they might choose to move to a smaller home with smaller maintenance needs that is closer to community services (Boldy *et al.*, 2011). They might also choose to move to another property or to a residential facility if their home layout, systems, and amenities do not match their functional abilities or present hazards. Home modifications can provide a solution for people ageing at home by adapting the environment to their needs. Examples of home modifications include the addition of new or adaptive systems to enable easy access, safe movement, comfortable performance of daily tasks like cooking, toileting, etc, removal of hazardous objects or situations, rearrangement of spaces, etc (Sanford and Butterfield, 2005). Home modifications increase independence and have been proven to reduce the need for formal and informal care (Carnemolla and Bridge, 2019).

### Assessment of functional ability and the home environment

Home modifications in Australia, as well as in many other countries, are prescribed by health professionals, usually occupational therapists. Occupational therapists have the training and experience to assess a person's functional abilities, level of disability, potential risks in the home and the home-person fit, in order for the individual to live independently, safely and comfortably at their homes. Assessment tools, based on scientific research, testing, and working experience, are usually employed by occupational therapists, as standardized ways for collecting and recording the necessary information for the individuals and their homes. Based on their observations and recordings, they can prescribe home modifications and assistive technology that will enable the clients to remain at their homes for longer.

There are three main types of tools assessing the functional ability and the home safety of older people and people with disability:

- Tools evaluating the home environment, e.g. clutter, fall and fire hazards, etc;
- Tools assessing the abilities of people to carry out daily tasks, their balance, their movement, their cognitive abilities, etc;
- Tools assessing the person-environment fit, where the person carries out tasks in their home and their ability is assessed in that specific context (Robnett, Hopkins and Kimball, 2003).

Each type of tool has unique characteristics and is used under different circumstances. The tools assessing the home are usually the simplest, have the form of checklists which can be administered by the residents themselves and might additionally include recommendations on how to make the home safer. More sophisticated versions include fire and electrical safety criteria and should be administered by professionals. These tools assess the safety of the environment without providing information on how safe a specific resident is in this environment, as they ignore their abilities or impairments.

The tools concentrating on the person assess their cognitive abilities and/or their balance and their ability to perform specific moves. Professionals have raised concerns about whether these tools can predict the person's performance in the home or how safe they are in this familiar environment.

The tools assessing the person-environment fit require professionals to observe how an individual performs in the home environment and what improvements can be made in the environment or in the way the person carries out daily tasks. The observations are used for occupational therapists to prescribe personalized home modifications and/or assistive technology or advice that will enable the individual to be safer and to live independently.

## **Home visits of health professionals and physical distancing**

Occupational therapists are probably the only professionals that can assess both the person and the environment, and their physical presence and active observation is considered vital for the prescription of home modifications. However, there are cases when visits of professionals to consumers' homes are considered of high risk or costly, such as when the consumer lives in a remote area or when physical distancing measures are in place. At the same time, the risk of home accidents is higher during periods of isolation or quarantine, when people spend more time in the home.

So, there is a contradiction between whether it is urgent for a home assessment to be performed and the need to be physically isolated. Telehealth is a very important tool that allows health practitioners to virtually visit people at their homes and perform assessments, however, the applicability depends on the client's relationship to technology (Foster and Sethares, 2014).



Self-assessment tools of functional ability of older people and people with disability as well as of their homes, might be a solution to the problem of identifying the needs of people and the modifications and systems needed to make their homes safe and comfortable while in quarantine or isolation or when visits from professionals are not considered cost effective.

## Importance of the Review

The needs of older people and people with disability for home modifications and assistive technology are greater during periods of isolation, when occupational therapists' visits should be avoided. Tools assessing the person-environment fit that can be administered by older people and their carers could provide an alternative to OTs visits or Telehealth sessions, when the consumer's knowledge and use of technology is limited. The use of these tools can provide valuable information to professionals who can then recommend home modifications that will increase the independence of older people and people with disability.

## Objectives

To identify and analyse the existing self-assessment tools or the tools that can be converted into self-assessment tools of the person-environment fit.

## Methods

This publication presents the results of the collection and review of the literature providing assessment or self-assessment tools of the functional ability and/or of the home environment of older people and people with disability. The objective of this review is to identify existing tools that can be used during periods of quarantine or isolation for self-assessment of the person-environment fit and that can highlight the needs of people for being more independent and safer in their home.

## Research Question

Which tools measuring the functional ability and/or of the home environment of older people and people with disability can be used for self-assessment during periods of isolation and quarantine?

## Question Refinement Strategy

A systematic review, guided by the *Protocol guidelines for systematic reviews of home modification information to inform best practice* (Bridge and Phibbs, 2003) was implemented in this study. The research question was refined into an operational format that could be researched systematically by application of appropriate criteria.

<b>Problem</b>	<b>Intervention</b>	<b>Outcome</b>	<b>Comparison</b>	<b>Target population</b>
Face-to-face assessments (home visits) of the home during periods of isolation or quarantine might present health risks	Self-assessment tools of functional ability and/or of the home environment	Highlight person's needs and prescribe solutions (home modifications or assistive technology)	Home visits or Telehealth	Older people and people with disability

**Table 1. Question refinement strategy**

### Search Terms

The terms included in Table 2 were used to search for relevant materials on electronic databases and the World Wide Web. These terms pertained to the tools for the assessment of the person or persons' functional ability and/or the home environment, the target populations, and the prescription of interventions to the physical environment. Comparison search terms were also identified to remove strategies that were not relevant to the subject.

<b>Problem</b>	<b>Intervention</b>	<b>Outcome</b>	<b>Comparison</b>	<b>Target population</b>
Reduced functional ability OR	Self-assessment of functional ability OR	Home modifications OR	Home visits OR	Older people OR
Reduced ability to perform daily tasks OR	Self-assessment of home OR	Independent living OR	Face-to-face assessment OR	People with disability OR
Environmental hazard OR	Self-assessment of the person-home fit	Assistive technology OR	Inappropriate solutions OR	Older adults OR
Multiple impairments OR		Environmental adaptations OR	Unprescribed solutions	Older population OR
Activities-of daily-living dysfunction OR		Reduction of falls in the home OR		Older people with impairments OR
Increased risk of falling		Home based interventions		Elderly

**Table 2. Search Terms**

## Search Strategy

The databases that were used in both editions of this publication, were:

- Ageline
- Web of Science
- AEI Informit
- ERIC
- EMB Reviews
- Medline
- AMED
- Cinahl
- Psycinfo
- Social Work Abstracts
- ARCH: Australian Architecture Database

## Outcomes of Search

The material included in this review needed to satisfy certain criteria: (a) needed to be accessible through the University of New South Wales Library or the World Wide Web, (b) was written in English, (c) included information about a tested tool and (c) included tool for older people or people with any degree of any mobility impairment. Materials which did not meet the inclusion criteria or were conference abstracts, unpublished conference papers, whole of subject books, checklists or referred to tools for people with specific disorders (e.g. dementia) were not included in the review. No restrictions on the date of publication were made.

With the use of the search terms listed in Table 2, 36 potentially relevant assessment tools were identified. Four of the tools had to be excluded as they were duplicates, not in English or were addressed only to people suffering from dementia. Out of the 32 remaining tools, 24 had to be excluded as they did not meet the inclusion criteria. Most of the excluded tools were checklists for the safety of the homes of older people or examined only the person's abilities or only the home environment. Finally, eight tools that met the inclusion criteria were reviewed.

Checklists and tools that did not satisfy the inclusion criteria but were considered useful for health professionals or consumers have also been mentioned in a different section of this review.

The review process, with the number of relevant tools, is outlined in Figure 1.

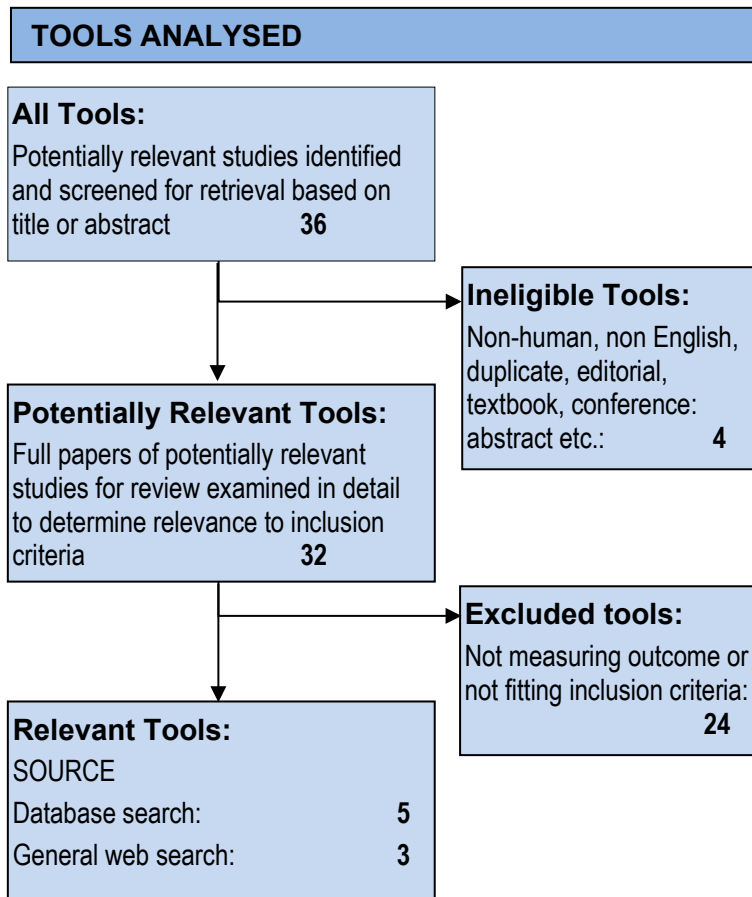


Figure 1. Review process flow

## Tools Analysed

Eight reference materials from the search were included in the analysis.

### Nationality of literature

Three out of the eight assessment tools included in the review were developed in USA and another three in Australia. One tool was developed by research teams in Canada and one in Sweden. Most of the teams who have developed assessment tools had a background in medicine, geriatrics, and occupational therapy. It is characteristic that five of the tools were developed in countries where home modifications are considered effective tools in enabling ageing in place and are, usually, funded. Even though many non-for-profit and academic teams perform research for home modifications in USA, it seems that incentives are limited and focused on specific parts of the population (Fagan and Cabrera, no date; Bleasdale and Smith, 2010).

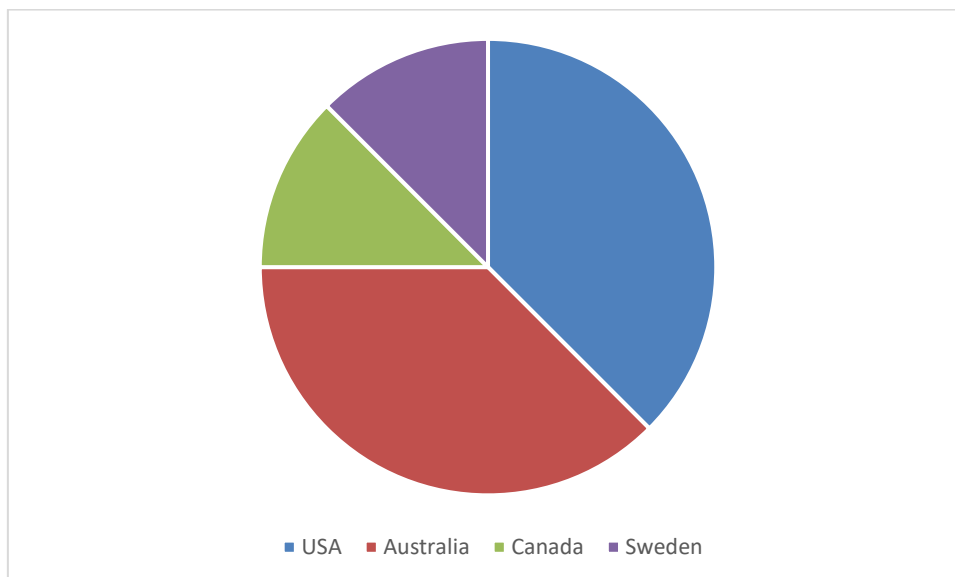


Figure 2. Nationality of literature

### Quality of evidence

The search yielded seven research-based reference materials and one tool developed and refined by feedback from professionals and clients. More experimental studies testing each of these tools were identified. Half of the assessment tools included in this analysis addressed older people while the other half addressed older people and people with disability, living in their homes.

### Data/inputs required by the tools

As indicated in the chart below, all the tools included in the review examine both the functional abilities of the resident, as well as the function and safety of the home environment for the individual. Three of the tools include also a third section, where priorities are set, and planning of the future actions is recorded.

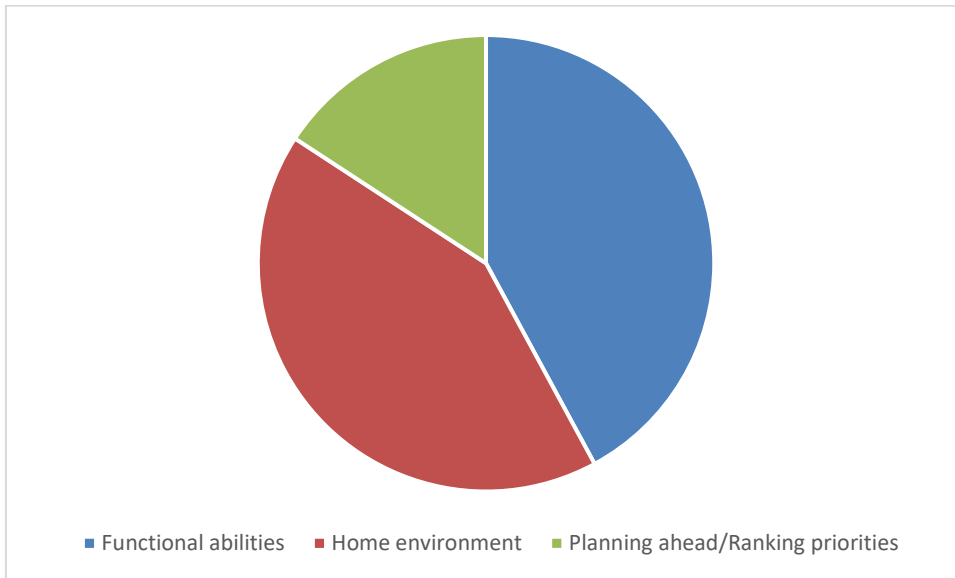


Figure 3. Tool required inputs

### Tool target assessor

Five of the tools analysed are developed to be administered by occupational therapists or other trained health professionals. Two tools need inputs from both professionals and the resident, while only the CASPAR was developed to be administered solely by the resident and/or their family or carers.

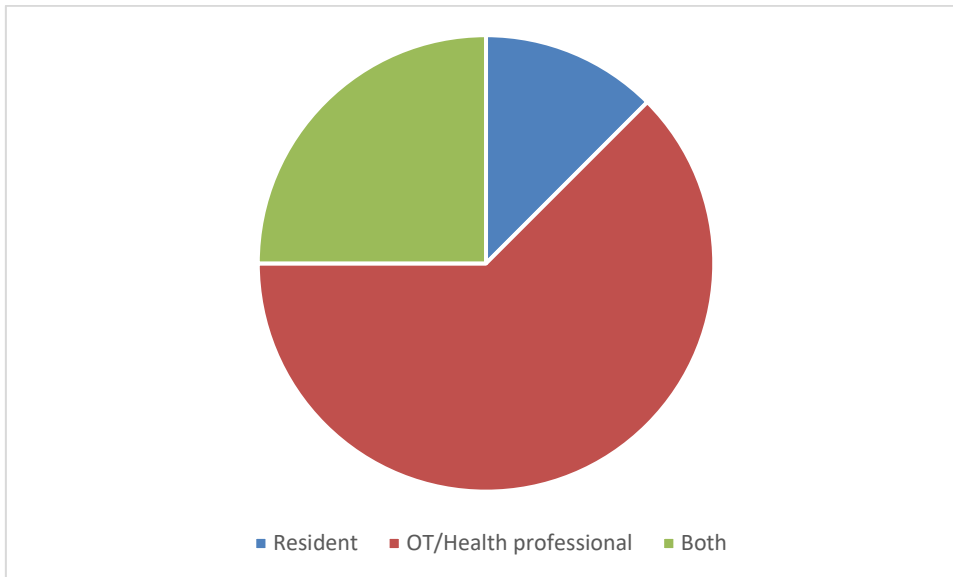


Figure 4. Tool target assessor

## Assessment tools

This paragraph includes the eight assessment tools that satisfied the inclusion criteria.

### Comprehensive Assessment and Solutions Process for Aging Residents (CASPAR)

The CASPAR is a protocol for the assessment of the functional abilities of people and the environmental characteristics of their homes, developed by J. Sanford et. al. in 2001 (Sanford *et al.*, 2001), to enable service provision to underserved older populations who live in remote communities. More specifically, the CASPAR was developed to assess an older person's functional limitations and difficulties and to identify elements in the home that might require modification to ensure safety and comfort.

The CASPAR includes a short first part where the older person needs to describe their abilities to perform simple tasks within the home and state any known health issues. Then, the specific difficulties encountered in each of the home rooms/spaces need to be identified. In the third part of the tool, the person needs to rank each of the problems identified in order of importance. The final section requires taking measurements of the home elements that are considered problematic or need to be modified.

The original study that introduced the CASPAR (Sanford *et al.*, 2001), compared the presence and absence of problems in 70 older people's homes and found that 88% of issues were addressed correctly by the residents. The inconsistencies that were found were related to measurements of home elements (e.g. height of steps), or home designs that were unusual and could not be described by the tool's sketches. However,

these issues can be overcome using photos and do not affect the assessment significantly. Another study compared the CASPAR tool, used, and completed by older people and/or their families, with a Televideo tool, assessing only the appropriateness of the home. It was found that in 70 homes, CASPAR identified 79.3% of the problems correctly, whereas the use of the Televideo tool resulted in 86.4% of the problems identified correctly. The main concern about the use of the CASPAR tool was the specialists' limited understanding of the task-performance and the physical environment elements, which relied on the residents' descriptions. The Televideo method was considered in that respect much more effective (Sanford and Butterfield, 2005).

The CASPAR can be purchased online.

### **Home Falls and Accidents Screening Tool for Health Professionals (HOME FAST-HP) and for Self-Reporting**

The HOME FAST-HP tool was developed by research teams in the university of Newcastle and the university of Sydney in Australia, to assess the areas or features of the home that might present fall and accident risks but also the ability of the person to carry out everyday activities with the existing home amenities. The tool is in the form of a questionnaire where an occupational therapist answers whether a statement is true or false and then give more specific details and comments about the situation of each resident-environment system.

The HOME FAST-HP tool had fair to good interrater agreement while all items except one (hazardous outside paths) were shown to have acceptable or excellent levels of reliability (Mackenzie, Byles and Higginbotham, 2002; Vu and Mackenzie, 2012; Romli *et al.*, 2017).

The authors of HOME FAST-HP have also developed a self-report tool (HOME FAST-SR) which can be administered by older people themselves or their family/carers. It includes 20 items, some of which are analysed in more sub-items. Excellent or fair to good agreement has been shown between HOME FAST-SR and HOME FAST-HP (Mackenzie and Byles, 2018). The HOME FAST-SR presented excellent interrater agreement between two occupational therapists for all the items included.

Both HOME FAST-HP and HOME FAST-SR can be downloaded from the website of the University of Sydney or from [www.stopfallsathome.com.au](http://www.stopfallsathome.com.au). Completing the HOME FAST-SR provides a score for the home which is an indicator of how serious is the fall risk for a resident (Hassani Mehraban, MacKenzie and Byles, 2011).

### **Client-Clinician Assessment Protocol (C-CAP)**

C-CAP Part I was developed by Gitlin & Corcoran in 2000, to assess older people's and/or people with disabilities perceptions of their independence, difficulty, and safety in performing daily life tasks. Unfortunately, the original work of the C-CAP developers or the tool itself could not be located via the internet or online libraries. The information included in this section are taken by studies that tested the tool. According to Petersson *et al.* (2007), Part I of the C-CAP tool includes the self-reported ability of a person to perform daily tasks, including personal activities of daily living (PADL),



instrumental activities of daily living (IADL), mobility and leisure, expressed as ratings in three scales: independence, difficulty, and safety. Parts II-IV are performance-based assessments conducted by specialists.

The study performed by Petersson et. al. showed low person separation, especially in the safety scale and possible lack of uni-dimensionality in the independence scale. Moreover, one item (bath/shower) had unacceptable goodness-of-fit in the difficulty and safety scales (Petersson *et al.*, 2007). Another study investigated the results of home modifications in clients' perception of their ability in performing everyday tasks in the home, using the C-CAP tool before and after the home modifications (Petersson *et al.*, 2008). The residents reported statistically significant improvement of their perceived abilities to perform everyday tasks. All four parts of C-CAP have been used in other studies (Szanton *et al.*, 2011).

## **Housing Enabler (HE)**

The HE is one of the oldest and more widely used tools for the assessment of the home features that might reduce the level of accessibility, considering the person's functional abilities. It comprises three components: The environmental component, the personal component and a checklist named "Housing standard", where the presence or absence of some necessary areas and elements, according to Swedish standards, is stated. The personal component needs to be administered by an occupational therapist or another health professional, however, the environmental component can be used by non-professionals with advance training and can by itself provide a valid assessment. The interrater agreement of the environmental component by real estate agents was between 78 and 83% (Iwarsson, Slaug and Fänge, 2012).

The HE has undergone numerous tests and validations and is considered a reliable screening tool. Since the home areas/features of the environmental component are described according to Swedish standards, the tool needs to be modified for application in other countries (Iwarsson, Haak and Slaug, 2012). The tool can be downloaded from the Enabler [website](#).

## **Safety Assessment of Function and the Environment for Rehabilitation–Health Outcome Measurement and Evaluation (SAFER-HOME) Tool, Version 2**

The SAFER tool was developed in 1991 by the Community Occupational Therapists and Associates with the aim to provide a comprehensive functional and environmental assessment for older people living in their homes. It consists of approximately 14 areas of possible concern with a total of 97 items or functions. The 14 areas includes the living situation within the community, mobility, the kitchen, eating, household management and fire hazards, dressing, grooming, bathroom, medication, communication, recreation, general items and security, wandering and memory aids

(Oliver et al., 1993). SAFER could be used as a safety assessment but not as an outcome measure tool (Chiu and Oliver, 2006). It is administered by occupational therapists using observations, interviews, and task performance.

Overall, the reliability of the tool was found to be adequate, while further research is needed to assure validity and predictive ability of the tool (Letts et al., 1998).

The SAFER-HOME tool is a more evolved version of SAFER. The areas and items of SAFER were initially kept but the rating scale changed from a binary to a 4-point rating scale (no identified concern, mild problem, moderate problem, and severe problem). After testing, the 97 items were reduced to 93, while 10 dimensions for the calculation of subscale scores were created. SAFER-HOME is one of the tools that assesses both the functional abilities of the individual as well as the impact of the (home) environment to their abilities (Chiu and Oliver, 2006). Further testing of its psychometric properties was recommended by its developers.

A resource mentioning a third version of the SAFER-HOME tool was identified through web-search, however, the study could not be retrieved. The 3rd version reduces the areas of assessment to 12 and the items to 74. It has not been possible to locate SAFER-HOME v.2 or v.3 through internet search.

### **In-Home Occupational Performance Evaluation (I-HOPE) Kit**

The I-HOPE tool was developed to identify elements of an older person's home that are incompatible with their abilities, by assessing daily activities and the role of the environment in their accomplishment. The tool is administered by health professionals, such as occupational therapists, and provides scores of activity participation and performance, satisfaction of the older person with their performance, and the level to which environmental barriers affect performance.

The interrater reliability of the I-HOPE was tested in 10 older individuals and was found to be very good (Stark, Somerville and Morris, 2010).

The I-HOPE can be purchased from the starklab website.

### **A Way to Stay: Home Modification Assessment & Planning Tool**

The "A Way to Stay" tool was developed by Scope Home Access for DisabilityCare Australia's National Disability Insurance Scheme (NDIS) to identify useful home modifications and assist individuals through the planning, assessment and construction quoting stages. It applies to people of any age with any degree of disability. It consists of three sections. The first section is filled in by the resident, where they need to consider and comment on the way they are currently using various areas in their home (access to the home, entrance, car park, rooms, etc) and how things might change in the future. The second section is administered by an occupational therapist and/or a

builder. This part examines the functional ability and the characteristic of the person, as well as all the home areas included in the previous section. Finally, the last section is an action plan, including the desires and priorities of the person, the recommendations of the occupational therapists and the quotes from builders.

The “A Way to Stay” tool is based on the knowledge and experience of the SCOPE Access professionals and refined with feedback from occupational therapists and SCOPE Access clients. The search for scientific and research documents testing the validity and reliability of the tool has not given any results.

The “A Way to Stay” tool can be downloaded from the Scope Home Access website.

### **The dimensions of Home Measure (DOHM) and Post Modification Satisfaction Questionnaire (PMSQ)**

The DOHM is a tool based on research by Aplin, et. al. (2016) at the university of Queensland, Australia, aiming to explore the dimensions of the home environment that play a significant role in the resident’s experience and affect decision making and acceptance of home modifications. The dimensions that were found to affect decision making are four: the personal, societal, physical, and temporal dimensions of home. The social and occupational dimensions were also used in the tool.

The DOHM was revised in 2016, after testing with the help of 163 community dwelling older adults and people with disabilities. A few items were added while others were revised. The revised version of the DOHM was shown to have preliminary evidence of construct validity, however, the unidimensionality, targeting and appropriateness of the rating scales needed to be re-examined (Aplin, Chien and Gustafsson, 2016). The DOHM tool (as well as journal articles for the progress of the tool) have not been identified.

### **Other tools**

The tools included in this category do not satisfy all the inclusion criteria mentioned above. Some of the tools do not include the assessment of environmental factors or the interaction of the person with their environment, they might investigate only specific home spaces, they could be addressed to older people living in institutions, etc.

### **Home Safety Self-Assessment Tool (HSSAT)**

The HSSAT is a tool developed by the Occupational Therapy Geriatric Group at the University at Buffalo, around 2010. The aim of the tool is to educate older people and OTs on how they can reduce the occurrence of falls at home. The first part of the tool consists of a checklist for use of the residents themselves, aiming to identify problematic or hazardous areas in the home. It is accompanied by images and lists of building elements that might cause falls, as well as common solutions to these issues. The second part of the tool provides information on useful assistive technology

elements and systems while the third part includes “before and after” photographs of home modifications. Then tips for preventing falls and a list of home modification providers are given.

The HSSAT was found to have satisfactory validity, reliability, and responsiveness (Tomita *et al.*, 2014). Other studies have found the HSSAT to be a useful tool for the education of older people on how to avoid falls in the home, which can be more widely utilised after further evaluation of its psychometric properties (Horowitz, Nochajski and Schweitzer, 2013; Horowitz, Almonte and Vasil, 2016).

### **Westmead Home Safety Assessment (WeHSA)**

The WeHSA is an assessment tool developed to identify fall hazards in older peoples’ homes. It is a comprehensive checklist of 15 items with multiple sub-items each and it is meant to be administered by an occupational therapist (or other relevant professional). Reviewers of the tool have confirmed the relevance of the items in identifying fall hazards; 80% of the checklist items had acceptable or good relevancy (Clemson, Fitzgerald and Heard, 1999). The tool items were also found to have fair to excellent interrater reliability (Clemson *et al.*, 1999).

The WeHSA is an extensive list of fall hazards in the home and can identify whether these hazards are present in a specific home and inform the residents about them. However, the questions that are specific to the person’s abilities and their interaction with the environment are very limited.

The Westmead Home Safety Assessment is provided in long and in short form versions and can be downloaded from the Falls prevention online workshops [website](#).

### **Cougar Home Safety Assessment (CHSA) 5.0**

According to the developers of the 5<sup>th</sup> version, the original version of the COUGAR tool was owned by the Consumer Product Safety Commission. Version 5, which was released in 2019, is a tool for occupational therapists to perform assessments of the home environment safety, but not of the performance of clients in the home. The four previous versions of the COUGAR have undergone field testing and have been adapted to the participating occupational therapists’ feedback. Content validity has also been performed for version 4, however, the work has probably not been published (Fisher *et al.*, 2019).

The main difference of the COUGAR compared to other home assessment tools for older people, is that it includes the assessment of a more wide range of safety hazards, like the absence of fire extinguishers, carbon monoxide and smoke detectors. One of the studies using COUGAR showed that it is a tool that can increase awareness of older people on the home hazards (Fisher *et al.*, 2008). The tool is available for download from the Misericordia College [website](#).

## Falls Behavioral Scale (FaB) for Older People

The FaB is a simple questionnaire about the older person's own perceptions about their behaviours related to falls and can be administered by the older person or their family. Its aim is to identify and evaluate behavioural factors that can protect an older person from falling in the home. The behaviours investigated are related to: Cognitive Adaptations, Protective Mobility, Avoidance, Awareness, Pace, Practical Strategies, Displacing Activities, Being Observant, Changes in Level, and Getting to the Phone. The developers of the FaB recommend its use as a tool for identifying the older person's behaviours and fears, for goal-setting and for identifying the types of strategies that need to be adopted for a specific individual (Clemson, Cumming and Heard, 2003).

## Safe at Home

The Safe at Home tool was developed for Occupational Therapists to quickly identify the degree to which an older person is aware of the hazards around their kitchen. It can be conducted in three phases: 1. Identification of hazards in the kitchen, 2. Provision of possible solutions, 3. Modifying the environment. The psychometric properties of the first two phases have been tested by the developers (Robnett, Hopkins and Kimball, 2003).

## Checklists and tools for residents

This paragraph includes tools in the form of checklists or Apps that residents can use to identify hazards in their homes and get recommendations for home modifications.

### DIYmodify App

DIYmodify is an App for tablets and smartphones developed by the HMinfo Clearinghouse. The goal of DIYmodify is to provide information and support for individuals to carry out five popular home modifications. The modifications include handheld showers; grab rails; handrails; threshold ramps and level shower access. The App also has an assessment of the resident's issues in the home and directs them to the right modification.

Details about DIYmodify can be found on the HMinfo Clearinghouse website, and the App is downloadable via the App Store.

### Check for Safety: A home fall prevention checklist for older adults

The Check for Safety is a simple checklist that can be administered by the older people themselves or their family or carers. It includes five areas: stairs and steps, floors, kitchen, bedrooms and bathrooms. Relevant questions for each area are used to highlight the hazards that might exist in each home space. Then mitigation strategies are proposed.

Check for Safety is an easy to complete checklist but is in no way exhaustive. It can be downloaded from the Centers for Disease Control and Prevention website, along with other useful resources for older people and for health professionals.

### **AARP HomeFit Guide**

A 36-page guide aiming to assist people to live safely and comfortably in their homes. It includes 12 areas of the home with recommendations for elements in each area. Even though it is a lengthy document, it includes helpful images and symbols. The guide can be read or ordered from the American Association of Retired Persons (AARP) website.

### **The Safe Living Guide**

The Safe Living Guide was developed by the Public Health Agency of Canada in 2005 and was last revised in 2015. It includes checklists and tips for older people that want to identify hazards and modify areas of their homes. It also provides advice on keeping fit and healthy, keeping track of medicine and assistive technology suggestions. The guide can be accessed through the Public Health Agency of Canada website.

### **Remodelling today for a better tomorrow**

A publication by the Hartford Center for Mature Market with advice and solutions for modifications for the kitchen and the bathroom for older people. The document can be accessed from the Hartford Center for Mature Market website.

### **[Re]Build**

ReBuild is a safety checklist for homes, developed by Rebuilding Together with material from other documents. The checklist can be found in the Rebuilding Together website.

## **Discussion**

The aim of the present review was to identify tools that assess how well a home environment works for their older resident or resident with a mobility impairment and whether these tools can be used by the resident and their family/carers themselves. The search resulted in a great number of tools that would assess the individual's functional abilities or the safety of the home, especially regarding fall hazards, but only a few that considered both aspects in a person-centred way. Eight tools were included in the review, and while some of the tools that did not satisfy all the inclusion criteria they are also mentioned for the readers' information.

From reviewing the eight tools that satisfied the inclusion criteria, it was evident that only two assessment tools can be used for self-reporting in their present form: the



CASPAR and HOME FAST-SR. The CASPAR requires the resident to describe their own abilities and limitations, assess their home environment and set priorities. The part that is certainly the most difficult to be carried out by a non-trained person is the measurement of features of the home that might require modification. A Televideo version of the tool was found to be more accurate than the purely self-reporting tool. This fact provides evidence that probably the use of all the tools would require a Telehealth-Televideo session with a specialist for more advanced home modifications to be prescribed.

The HOME FAST-SR is a tool that showed good agreement with the HOME FAST-HP, which is the tool developed for assessment by occupational therapists. However, the HOME FAST tools mostly investigate the tripping or slipping hazards in the home and less whether the home enables the resident to participate in all aspects of the home life.

An important observation that came out of the comparison of the tools is that four out of the eight included tools (CASPAR, C-CAP, HE and A Way to Stay) have two or three distinct sections: a section that describes the abilities of the resident, a section that describes the interaction between the resident and the home or the home elements that are considered problematic for the resident and a third section, included in some tools, with recommendations and future planning. The DOHM might also have the above organisation of the questions, however, the tool has not been retrieved. The organisation of the questions in sections probably assists the person who administers the questionnaire (the resident or an occupational therapist), concentrate and provide more information on each area of interest.

All the tools that were included in the analysis have been tested and improved, based on the residents' and health professionals' feedback. However, some of the tools were tested in a more systematic way: the psychometric properties, the reliability and the unidimensionality were tested with control samples and the results were used for improving the tools. This scientific process can be performed numerous times and can be time and resource consuming. However, this step is crucial, especially for tools that are administered by non-professionals, as it ensures reliability of the results.

Since many of the tools that were examined are available only for purchase, a direct comparison of their contents and characteristics could not be achieved. A future study, aiming to produce a tool for self-report, would have to compare the tools, use one of the tools or synthesize a new assessment tool from the ones described above, test its reliability in controlled conditions and then be trialled in real-life conditions. Inclusion of a wider range of home parameters, such as the presence of extinguishers, of carbon monoxide and smoke detectors, as described in the COUGAR tool, is also considered necessary, as many older people store old and many times flammable objects (Kim, Steketee and Frost, 2001).

## Conclusions

Home modifications and assistive technology increase older people's and people with disability independence and safety, while reducing the need for formal or informal care (Carnemolla and Bridge, 2019). To prescribe the appropriate solutions, professionals use tools assessing the functional ability of the resident in their home environment, or more accurately, the person-environment fit. When the visit of a professional is considered inefficient or dangerous for any of the parties involved, self-administered assessment tools can be used.

The present review analyses the existing self-assessment tools or the tools that can be converted into self-assessment tools of the person-environment fit that were identified through a systematic review procedure. Eight tools that can be converted to self-assessment tools were identified. Further research is required for this conversion and for the evaluation of the usefulness of such tools.



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## Useful websites

<https://sites.google.com/site/studentcapstone122/assessment-tools/safer>

[https://homemods.org/wp-content/uploads/2019/06/Assessments\\_3.20.19\\_Professionals.pdf](https://homemods.org/wp-content/uploads/2019/06/Assessments_3.20.19_Professionals.pdf)

<https://stopfallsathome.com.au/>