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Physical Environment Maintaining Independence and Self-management of Older People in Long-Term Care Settings—An Integrative Literature Review

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ABSTRACT



The physical environment of long-term care settings can contribute to maintaining the self-management and independence of older people. This integrative literature review examined which features of the physical environment were considered valuable, and how they contributed to self-management and independence. The findings from 15 studies were grouped into two themes: the features supporting functionality, orientation, and safety and the features fostering motivation, attractiveness, and comfort. An optimal environment requires features of both themes to be present. Older people need to be able to do things they consider enjoyable in a place commensurate with their ability to function.

KEYWORDS

Independence; long-term care; older people; physical environment; self-management

Introduction

Staying active at an older age requires a balance between people's abilities, the aging process, and the surrounding environment (Cramm et al., 2012). During the aging process, there is a reduction in an individual's functional and cognitive capacity, which can make everyday life challenging if it occurs in an unfit environment (Franco et al., 2015; Lawton & Nahemow, 1973; van Hoof et al., 2010). Older people's self-management and independence i.e., their ability to perform the activities of daily life, to move around, to participate in meaningful activities, and to function independently are constituents that shift life from being merely survival to living. Therefore, the functions mentioned above can be enhanced by a physical environment of good quality. Although aging in one's own home, in a familiar neighborhood is the desire

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of many older people (Stones & Gullifer, 2016), the home may become an unsafe place where even the simplest daily tasks are difficult to complete (Fausset et al., 2011). In these situations, it is beneficial for the older person to relocate to a more suitable environment, e.g., long-term care (LTC) settings, targeted to meet the needs of older people and continue living there (Abdi et al., 2019). If the physical environment of one's own home fails to comply with the needs of everyday life (Pettersson et al., 2021), LTC settings could be assumed to be a better option.

Interest in the importance of the physical environment has increased in recent years because of the rise in the aging population (United Nations, Department of Economic and Social Affairs, Population Division, 2020) and the new policies and guidelines of the care and service systems for older people (World Health Organization, Regional Office for Europe, 2017). The emphasis of these policies has been "aging in place" which targets adapting existing living environments to extend the dwelling time in a familiar environment, usually one's own home. Despite advocating aging in place, the relocation into the LTC setting is a reality for those older people who have complex health needs (Hollinghurst, 2020). Health-related issues are one of the most significant causes of relocation, dementia is one of them (Granbom, 2019). Research is needed to provide information on how the evidence-based design (EBD) features have been implemented in LTC settings and also, to provide a more comprehensive understanding of the association between the physical environment and the residents' self-management and independence.

To determine older people's self-management and independence, the nursing needs theory of Henderson is used as a framework (Henderson, 1978; Meleis, 2018); the theory demonstrates 14 basic human needs. During the aging process, previously apparent basic needs, such as eating and drinking, moving, and participating in various forms of recreation, become challenges in everyday life. Henderson's theory suggests that a patient is independent when successfully performing these 14 needs. Although the theory is based on a hospital context, the basic needs are equally essential in the LTC setting even though the goal there is ensuring good aging at the end of life rather than recovering from illness. An older person's failure to independently perform these needs increases her/his dependency level and thus decreases self-management ability (Dijkstra et al., 1998). Self-management can also extend to a compromising of a person's psychological aspects, such as the ability to identify her/himself as important to others (Cramm et al., 2012).

An optimal physical environment in an LTC setting is, for example, stimulating, esthetic and familiar, and designed to ease everyday functioning (Peters & Verderber, 2021; Pomeroy et al., 2011; Rijnaard et al., 2016). There is evidence that a good quality environment enhances well-being and quality

of life (e.g., Fleming et al., 2016; Parker et al., 2004). Guidelines exist for memory disorder specialized care units to create home-like tranquility, and supportive care environments (Calkins, 2018; Chaudhury et al., 2018; Marquardt et al., 2014). However, some studies have shown a deficiency in environmental quality (Nordin et al., 2017; Potter et al., 2018) and it is also acknowledged that the daily routine of LTC residents is mostly inactive and sedentary (den Ouden et al., 2015). An appropriate physical environment increases the amount of active time (Douma et al., 2017). Less is known, however, about how physical environments in LTC settings offer possibilities for self-management and independence, such as continuing a familiar lifestyle, participating in daily household chores, and other activities of daily living using the older person's own resources.

This review article focuses on the physical environment of LTC settings and is limited to their interior and outdoor spaces. Evidence-based design continues to grow in healthcare facilities (Laursen et al., 2014). The design features that benefit people with a memory disorder are well-known and implemented in specialized care units (Marquardt et al., 2014). The quality of the physical environment in LTC settings determines how well an older person can manage his/her daily tasks. It can be assumed that the physical environment should be suitable for the individual to maintain self-management and independence while reducing the amount of personal assistance required. This assumption affects the costs of LTC and the number of staff needed. For the older people themselves, the environment offers the opportunity to live a meaningful and active life. However, a systematic analysis of the evidence on the quality of the physical environment in older people's care settings is lacking. This review aims to describe those features of the physical environment which contribute to older peoples' self-management and independence in LTC settings.

Methods

Study design

An integrative review was undertaken and was conducted according to the five stages described in Whitemore & Knafl (2005): (1) problem identification, (2) literature search, (3) data evaluation, (4) data analysis, and (5) presentation. This strategy was chosen because it provides a practical approach to understanding the literature on a particular topic by summarizing key themes and allowing the combination of diverse methodologies.

Search strategy

The SPIDER tool was used to define the search terms. The SPIDER (Sample, Phenomenon of Interest, Design, Evaluation, Research type) tool

facilitates rigor in research by offering a systematic strategy for searching for qualitative and mixed-methods research studies (Cooke et al., 2012). The search was not limited by study methodology or research type and these elements of SPIDER were not included. Preliminary searches using the keywords “self-management,” “independence” and “older people” were used to outline all relevant search terms. The diverse use of other relevant words was observed in the literature. After consulting an information specialist at the university library, the final search terms were determined. The search terms were composed of four terms: (1) older people, (2) self-management/independence, (3) physical environment, and (4) long-term institutional care. Boolean operators and combinations of MeSH terms and free search terms, with their synonyms, were used to identify all relevant studies. MeSH terms are standardized keywords that describe the subject of a journal article. The PubMed/Medline and CINAHL databases were systemically searched for empirical studies (Supplement S1).

The search was conducted in May 2021 and was limited to the articles with available abstracts and written in the English language. The search resulted in 1090 references, of which 971 were excluded based on title and/or abstracts. Full text of a total of 104 articles was read whereby 91 of them were excluded: 22 were review articles, 30 did not include detailed features of the physical environment, 25 were summative, descriptive articles without empirical evidence, and 13 for some other reason. A flow-chart of the literature search is shown in Figure 1.

Study selection

Two researchers (NW and NN) first evaluated the titles and abstracts based on the eligibility criteria. The empirical studies were included when dealing with the physical environment, self-management, and independence and were conducted in facilities for older people providing 24 h care. In addition, studies conducted in specialized dementia units were included based on the knowledge of the prevalence of cognitive decline in old age (Domingos et al., 2021; Joubert & Chainay, 2018). Studies were excluded if any detailed features of the physical environment were not presented. Physical activity studies where the physical activity was defined as exercise were excluded. Discrepancies between evaluations were acknowledged and discussed with the inclusion decision being made with mutual agreement. Identification of relevant studies was performed in an over-inclusive matter. This was done to eliminate irrelevant studies while ensuring that nothing relevant was lost. One researcher (NW) evaluated the full papers and decided whether they met the agreed eligibility criteria. The search was completed by examining the reference lists of the selected studies to locate

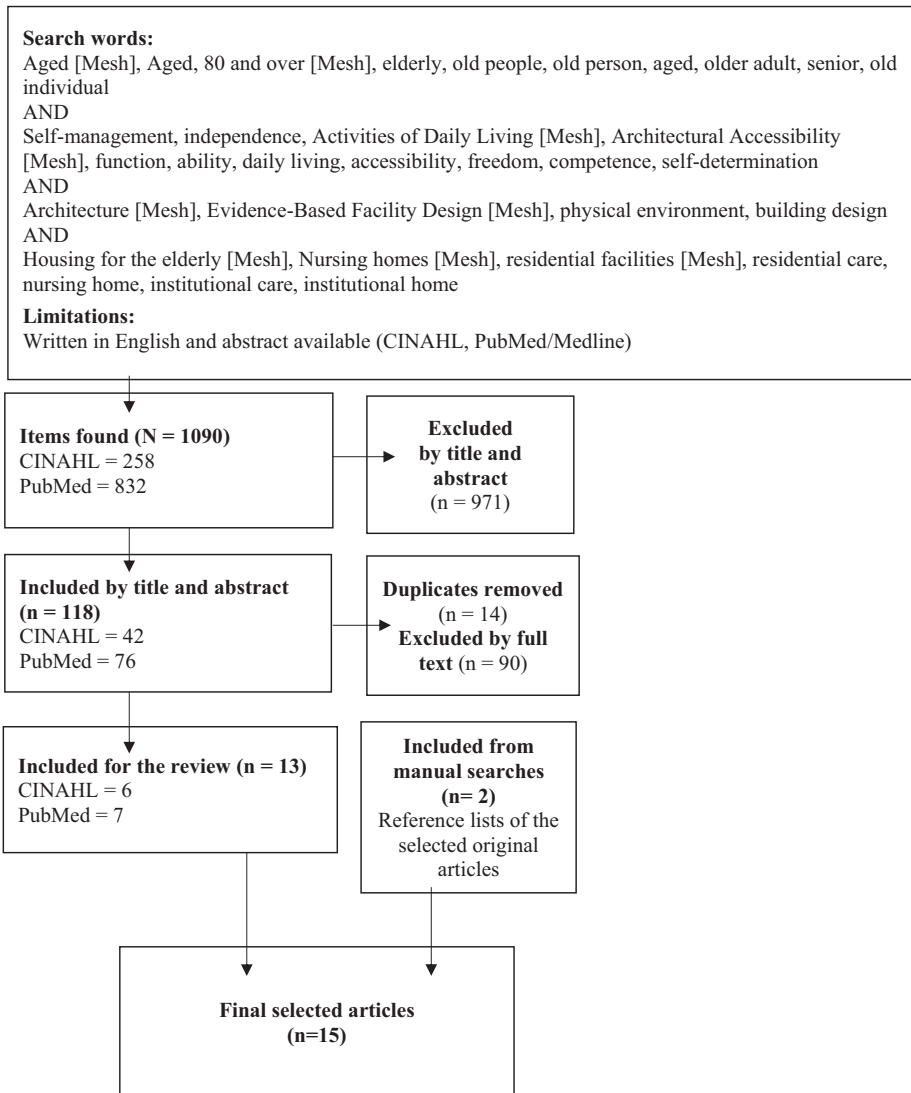


Figure 1. Flowchart of literature searches.

any relevant work not identified by the database search. If the title gave indications that the article might be appropriate for the review scope, it was assessed as a full text against the eligibility criteria. The final inclusion was determined by the joint decision of the research group (Characteristics of included studies are presented in [Supplement S2](#)).

Study quality

The Mixed Methods Appraisal Tool (MMAT Tool) was used to assess the quality of the included studies (Hong et al., 2018). The MMAT was selected because the included studies were conducted with various methods and the

MMAT tool can be used to assess studies with different designs. With the tool, according to each study design, five predefined criteria are answered with Yes, No, or Can't tell. The articles were defined as having high quality when they reached five Yes answers, good quality when they reached four Yes answers, and medium quality when they reached three Yes answers. Two researchers evaluated (NW and NN) the selected studies and discussed the assessment. Studies were found to be of medium to high quality ([Supplement S3](#)). However, in some studies, it was not entirely clear whether the study results were solely due to the features of the physical environment. They were decided to be included in the study.

Data analysis

Data were extracted according to the following parameters: study details, research design, aims, sample population and size, a type of LTC setting, physical environment features, objectives of the study, data collection methods, and results. Throughout the literature review, only results related to self-management and independence were extracted and analyzed. The physical environment features were reviewed and grouped into categories for comparison. Synthesis occurred throughout the process. The identified physical environment features were grouped into two themes based on how they influenced self-management and independence. The results of the analysis are presented in [Table 1](#).

Findings

Description of the studies

Of the 114 articles identified, a total of 15 articles ([Table 1](#)) were eligible and were assessed. Five studies were conducted in specialized dementia care units. The articles were published from 2009 to 2020. The findings had an international perspective, with articles from Europe ($n = 9$), Northern America ($n = 5$), and Australia ($n = 1$).

Interviews were the most common data collection method. Of the 12 articles, in six the data were collected by interviewing, in the other six the interviews were complemented with observations. An environmental evaluation had been performed in six studies and in two architecturally different units were compared. In three studies, assessment tools for functional status, orientation ability, and activities were used. Thus, qualitative methods were emphasized in the reviewed material. In those articles ($n = 7$) where the data were collected both from residents and from staff members or unit managers, the results were presented as a synthesis of all

Table 1. Characteristics of the publications included in the review ($n = 15$).

Author, country, year	Context	Participants	Data collection	Objectives of the study	Physical environment features		Study quality (assessed by MMAT)
					Theme 1	Theme 2	
Mahrs Triäff et al. Sweden 2020	ALF	13 residents 13 staff members 4 unit heads	Observations Interviews	Physical activity	Layout; size, corridor Doors Thresholds	Furniture Garden	5/5
Van Hecke et al. Belgium 2019	RCF (dementia)	4 residents 4 staff members, director and architect	Observations Interviews Architectural analysis	Spatial usage and experience	Circulation space	Views Garden	5/5
Suhonen et al. Finland 2018	NH	14 unit managers	Focus group interviews	Functional ability	Illumination Walkways Handrails Grab bars	Furniture Plants Decoration Colors Art	5/5
Nordin et al. Sweden 2017	RCF	54 residents 25 staff members 4 relatives	Observations Interviews Environmental assessment	Activity Interaction	Layout; open plan, corridors lounges Doors/elevators Thresholds	Windows Personal effects	4/5
van Steenwinkel et al. The Netherlands 2017	RCF	7 residents 7 staff members	Observations Interviews	Freedom	Layout; open plan, size Doors Flooring	Garden/outdoors Furniture Personal effects Views	5/5
Richards et al. Australia 2015	RCF (dementia)	13 residents 4 staff members	Observations Interviews Walk-through visual assessment	Occupational engagement	Layout; open plan, size, Doors	Garden Stimulating objects (fish tank)	3/5
Hung et al. Canada 2014	LTCF	26 staff members 2 unit managers	Focus group interviews Environmental assessment	Mealtime experiences	Layout; open kitchen	Lighting Glare Sound Coffee machine Furniture	5/5
Rodiek et al. USA 2014	ALF	76 residents	Survey Focus group	Freedom	Doors Thresholds/Landings	Furniture	3/5

(continued)

Table 1. Continued.

Author, country, year	Context	Participants	Data collection	Objectives of the study	Physical environment features		Study quality (assessed by MMAT)
					Theme 1	Theme 2	
Morgan-Brown et al. Ireland 2013	NH (dementia)	36 residents	Interviews Environmental audits Assessment tool for activity (comparison before and after renovation)	Occupation Social engagement	Layout; open plan	Open kitchen	4/5
Chang et al. USA 2013	NH	68 residents	Assessment tool for residents' functional status (comparison 2 types of NH)	Functional ability	Layout	Open kitchen	3/5
Barnes et al. UK 2012	ALF	32 residents	Focus group interviews	Supportiveness	Layout; corridors, size Doors Threshold Flooring, Elevators/ramps	Private apartment Greenhouse Views Garden	5/5
Benjamin et al. Canada 2011	LTCF	48 residents 62 staff members 42 "significant others"	Focus group interviews	Physical activity	Layout; size, hallways, spaces Storage Walkways	Garden	5/5
Innes et al. UK 2011	Care homes (dementia)	29 residents 11 relatives	Focus group interviews	Accessibility Understandability	Layout Doors Wayfinding cues	A choice of spaces Garden Views	5/5
Lu et al. USA 2011	ALF	50 residents	Focus group interviews	Physical activity	Layout Handrails Flooring Elevator.	Seating A choice of spaces Artwork Views Plants	5/5
Marquardt and Schmiege Germany 2009	NH (dementia)	450 residents	Orientation measurement	Spatial abilities Mobility Independence	Layout; open plan, corridors, size Fixture Fitting Furniture		3/5

ALF: assistant living facility; RCF: residential care facility; NH: nursing home; LTCF: long-term care facility.

participants. Therefore, it was not possible to conduct sub-analyses by different study populations.

The influence of the physical environment on older people's self-management and independence in LTC settings

The findings from an inductive content analysis of the 15 articles were grouped into two themes (Table 2). The features of the physical environment which were shown to be connected to older people's independence and self-management were divided into (1) the features supporting functionality, orientation, and safety and (2) the features fostering motivation, attractiveness, and comfort. When features of both these two themes are present, the physical environment encourages older people's self-management and independence.

The features supporting functionality, orientation, and safety

The features of the physical environment in this theme were mostly connected to the building's overall layout. The size and number of spaces (private vs. communal spaces), the length and width of corridors, and an open plan concept were mentioned in 11 articles. Other features influencing independence and self-management which appeared frequently were doors, elevators, and ramps and integrated, assistive features, such as handrails and grab bars. The physical environmental features supporting functionality, orientation, and safety were reported most often as being missing or inadequate by the participants. There were several features that affected how independently a resident could act.

Building layout determines how the surface area is divided between private rooms, circulation areas, lounges, dining rooms, storage, and maintenance. It also determines how these spaces are situated in the building. Whether it was a private room or a communal space, spaciousness was appreciated, for example, an undersized communal room prevented activities from being offered to all residents at the same time (Richards et al., 2015) and prevented the use of the space by those needing assistive devices (Benjamin et al., 2011; Van Steenwinkel et al., 2017). In addition, "a small isolating cell" as a private room (Van Steenwinkel et al., 2017) allowed only a limited degree of functionality. An open plan eased both physical and visual access (Hung et al., 2016; Van Steenwinkel et al., 2017) and facilitated residents in finding their way (Marquardt & Schmiege, 2009).

The width and the shape of the corridor were more valued than the length. For mobile residents, the long corridors equaled more possibilities. They were reported to be places for exercise (Lu et al., 2011) and to practice walking skills, but for the less mobile individuals, long corridors

Table 2. Summary of thematic analysis of review.

Number of studies	The features supporting functionality, orientation, and safety	The features fostering motivation, attractiveness, and comfort
	Open plan; layout of the floor plans	
9	Spaciousness -> enabled participation in the activities, facilitated accessibility and maneuverability of assistive devices, fostered movement and experience of freedom. Unambiguousness -> promoted autonomy and wayfinding	Openness -> felt attractive to follow up or to participate daily chores, offered natural and meaningful contacts and occupational engagement A choice of space -> allowed more opportunities, created interactivity with environment, self-directed activities
	Outdoors	
8	Accessibility and availability of seating -> facilitated physical activity and outdoor usage	Recreation, attraction, and meaningfulness -> Beautiful landscape, flowers, animals -> Multiple places to choose, garden chores
	Corridors	
7	Width -> allowed walking alongside, encouraged to walk Length -> offered the potential for physical activity, places to practice walking skills, "shortened" by seating, affected an orientation ability	Lighter corridors -> encouraged to walk Things to see -> invited to move around
	Home-likeness	
7	Memorable reference points -> supported orientation	Aesthetics, pleasure -> colors and materials, pictures, artwork, window views, plants, pleasing sensory level (lighting, heat control, noise, smells)
	Degree of urbanization, window views	
7	Large windows -> allowed a standing, sitting or even lying person to see out	Observing outside world -> watching children play, following the seasonal changes, bringing outdoor to indoors, providing garden views
	Doors	
6	Automatic -> facilitated movement Easily opened manual doors -> increased accessibility and movement Locked -> limited the ability to be physically active and independence	Locked -> Missed opportunities for freely movement
	Size of private rooms	
6	Spaciousness -> provided space for moving around and helped maneuver with assistive devices	Spaciousness -> provided the option of having personal belongings and furniture
	Flooring, thresholds	
4	Carpeted floor -> easy to walk on Color differences -> caused optical illusion of level difference Threshold -> restricted movement	Carpets -> considered lovely and tasteful
	Grab bars, handrails	
4	Assisted the ability to function, by helping to maintain balance and avoid falling	
	Elevators/ramps	
3	Facilitated moving around independently	
	Illumination/glare	
3	Brighter and well-lit areas encouraged to walk	Pleasing environment
	Walking loop	
2	Facilitated activities.	Pleased to walk the whole, long circuit.
	Clutters of equipment	
2		Decreased attractiveness.

Complete analysis presented in [Supplementary Table S4](#).

formed a barrier (Mahrs Träff et al., 2020). A too narrow corridor impeded people from walking alongside each other and complicated encounters (Barnes et al., 2012). The shape of the corridors affected the resident's orientation significantly (Marquardt & Schmieg, 2009). A corridor with no windows and leading to a dead end was not a good choice (Van Hecke et al., 2019) and from a safety aspect, handrails and floor coverings were two critical design elements (Lu et al., 2011). Carpeted flooring was appreciated since it was easy to walk on (Lu et al., 2011), but color differences in floor materials caused an optical illusion of a level difference (Van Steenwinkel et al., 2017). Handrails were important for helping to maintain balance and avoid falling (Lu et al., 2011).

Availability and location of elevators were widely seen to be inadequate (Barnes et al., 2012; Benjamin et al., 2011), and if available, they were too small for people using assistive devices (Lu et al., 2011). The doors were problematic in many ways: locked (Innes et al., 2011; Mahrs Träff et al., 2020; Van Steenwinkel et al., 2017) and heavy doors (Barnes et al., 2012) restricted access to different spaces and thus, associated with levels of outdoor usage (Rodiek et al., 2014). Door thresholds were troublesome, particularly for residents in wheelchairs but even for walking residents (Barnes et al., 2012; Rodiek et al., 2014; Van Steenwinkel et al., 2017). Thresholds also made going outside difficult (Rodiek et al., 2014; Van Steenwinkel et al., 2017). This made residents highly dependent on relatives or staff when going outside (Van Hecke et al., 2019), especially if in the outdoor areas the ground was uneven and skewed due to poor maintenance (Mahrs Träff et al., 2020).

The features fostering motivation, attractiveness, and comfort

This theme includes the pleasantness of the environment. A pleasant physical environment attracted older people to spend time outside their own private room (Morgan-Brown et al., 2013) which improved for example recall ability and self-performed eating (Chang et al., 2013). The possibility to choose between spaces (Innes et al., 2011) or furniture (Mahrs Träff et al., 2020) enhanced residents to move around. Also, observing or participating in daily chores invited residents to spend time in communal living areas (Chang et al., 2013; Morgan-Brown et al., 2013). It was reported that the lighting, colors, and plants made the residents feel the environment was more pleasant (Innes et al., 2011; Lu et al., 2011; Suhonen et al., 2019). Other similar physical features were artwork and pictures (Lu et al., 2011) and personal and meaningful items (Innes et al., 2011). They were described as “pull factors” that residents stay active (Richards et al., 2015).

The most often mentioned features in this theme were window views and gardens. A wide variety of views were described: the views of woods

(Lu et al., 2011), of the garden (Barnes et al., 2012), of the people passing by (Van Steenwinkel et al., 2017), and of the children's playground (Innes et al., 2011; Nordin et al., 2017; Van Hecke et al., 2019). For those residents that mostly had to stay inside the window, views were important, for example, because it helped residents to follow seasonal changes and thus maintained a sense of time (Suhonen et al., 2019; Van Hecke et al., 2019). Besides views, windows also provided natural light (Benjamin et al., 2011; Hung et al., 2016). It is interesting that the views were considered important, but less attention was paid to their size or height from the floor. The study by Nordin et al. (2017) was the only study, which mentioned the large floor-to-ceiling windows which allowed a standing, sitting, or even lying person to see out.

All outdoor spaces, but especially gardens, were appreciated. As mentioned earlier, the features supporting functionality, orientation, and safety influenced the use of the garden, but gardens and outdoor areas were described as a comforting and enjoyable places with plenty to see (Lu et al., 2011). A walking loop (Nordin et al., 2017) and paved walkways (Benjamin et al., 2011) contributed to residents' ability to move around in the garden. Gardening (Innes et al., 2011) and growing vegetables (Van Hecke et al., 2019) were familiar chores for many older people. Terrace and glazed patios were seen as an alternative to a garden but being outdoors in these areas mainly involved sitting and observing, with no opportunities for activities (Van Hecke et al., 2019). The outdoor spaces which were badly maintained (Mahrs Träff et al., 2020) or were surrounded by steep slopes and located near a motorway were rarely used (Nordin et al., 2017).

Discussion

This review aimed to describe which features of the physical environment in LTC settings have an influence, either positive or negative, on residents' self-management and independence. Two themes were identified, including (1) the features supporting functionality, orientation, and safety, and (2) the features fostering motivation, attractiveness, and comfort. Neither one is enough on their own, but both should be considered to design, modify and equip supportive LTC environments for older individuals.

An increasing amount of research shows the need for activity of older individuals in LTC, however, also an increasing number of studies report a variety of barriers in the environment that deter self-management and independence (e.g., Mahrs Träff et al., 2020; Richards et al., 2015; Rodiek et al., 2014; Van Hecke et al., 2019). It was interesting that in the studies reviewed, the deficiencies and the barriers in the physical environment were more often reported than the enhancers and enablers. This does not

necessarily mean that in LTC settings the support for self-management and independence is absent. It may be because it is natural to detect shortcomings that make daily tasks more difficult, rather than those that make it easy. However, the high number of reported impediments older people are facing every day contradicts the aspiration to create healthy and stimulating conditions for older people (World Health Organization, Regional Office for Europe, 2017).

It has been noticed that the availability of beds in LTC settings, rather than personal preferences or person-environment fit, determines where older people “end up” spending the rest of their lives (Innes et al., 2011). Henderson’s nursing needs theory recognizes 14 basic needs, which indicate a person’s dependency level. With some help from environmental features, these needs can be reached. For example, the smallest contribution of the physical environment to the basic need of “mobility,” is to adapt features that make moving possible, such as wide corridors or handrails. To satisfy the basic need of “eating” might require table access for wheelchairs or a pleasant kitchen environment with familiar aromas. Some of these features are simple to be introduced to LTC settings to promote an older person’s basic needs, for example, to use colors or to install handrails. Changing a building’s layout demands more effort, and some features may even be impossible to change afterward, for example, the widening of corridors. Therefore, the design solutions made about the physical environment of an LTC setting have far-reaching effects and they should be considered carefully. Currently, those settings built in past decades may not be suitable for future use or even present usage. Since it is acknowledged that older people tend to be facing complex health needs (Abdi et al., 2019) the requirements set for the physical environment are inevitably increasing. In the past few years, the dwelling time in LTC settings has shortened (Schön et al., 2016) and presumably this will also impact the physical environment.

When planning modifications to older facilities or designing new ones, the environmental features should be examined considering both of the themes of the present review. For example, considering lighting in LTC facilities, focusing purely on functionality, orientation, and safety, bright, well-lit areas might be enough. However, institutional, cold, bright lights may cause an aversive atmosphere even though succeeding to create safety and functionality. On the other hand, one good example of a feature related similarly to both of the themes is doors. Locked doors undermine the feelings of independence and diminish opportunities for activities (Innes et al., 2011; Mahrs Träff et al., 2020) even though the reason for locking doors might be to ensure the safety of the residents. Noteworthy is that this implies the physical environment not being in all cases a boundary

to self-management and independence, but the way it is used. In the future, there may be technology (Grigorovich & Kontos, 2020) available, for example, smart sensors which facilitate balancing these difficult aspects in easier ways.

In addition, accessibility standards mandate requirements for diverse environmental features, but it was observed in the present review that these requirements were not always followed in the LTC settings (Rodiek et al., 2014). Moreover, sometimes following standards may not lead to the best solutions (Lee et al., 2018) and they should therefore be reviewed and updated regularly. It is of concern if the managers of LTC settings by following these standards and guidelines are assuming that the physical environment is safe and suitable for the residents (Suhonen et al., 2019).

Also, it might be a question of values rather than financial aspects, as regards how LTC settings are perceived. The findings of this review reflect the perceptions of the residents, their families, and friends, as well as the staff members and managers. The opinions and viewpoints of different groups of people should be made visible; for example, what views do the staff or managers of the settings have and how do these opinions relate to the residents' assessments. Perhaps these opinions and viewpoints have an impact on the background. Unfortunately, the articles reviewed did not report the views of different groups separately. In the future, it would be informative to study the perceptions of the different groups independently. Furthermore, it would be essential to identify and explore effective interventions that increase the self-management and independence of those living in LTC settings. Such interventions should focus on not only optimizing the built environment but also making caregivers aware of their working environment from the perspective of an age-friendly living environment. If the meaning of these settings is preserving life and making them joyful places which allow older people to continue living the life they are used to, is it important to create environments that protect older people's ability to maintain their self-management and independence. Investing in physical environments may facilitate self-management and independence and improve the quality of life of older people in LTC settings.

Strengths and limitations

The research on the physical environment and its utilization as an empowering resource in LTC environments are scarce. Research especially focusing directly on older people's possibilities to continue independent living in LTC settings, is lacking. Therefore, this review aims to fill this research gap. Finding all the self-management and independence-related studies, while avoiding getting a redundancy of citations, caused a dilemma when

defining the search terms. For example, physical activity and mobility were in several studies defined as exercise, in others as daily activities. The search terms were scrutinized, and it was concluded that adding a term would not have resulted in more relevant citations. The searches were limited to two databases in the field of nursing and health sciences, CINAHL and PUBMED/Medline. However, these are considered comprehensive and partly overlapping, and therefore, sufficient to perform searches for a systematic review on nursing topics (Subirana et al., 2005).

By using multiple databases more relevant citations could have been disclosed. However, except that the language should be English, no limitations were made. Two researchers independently processed the citations which strengthened the inclusion. Although the findings are based on a relatively small number of studies, they present a wide spectrum of environmental features.

Conclusions

For the physical environment of older people to support the maintenance of their self-management and independence requires features supporting functionality, orientation, and safety and features fostering motivation, attractiveness, and comfort. Older people need to have connections to their previously lived lives and be able to do things they consider enjoyable in a place commensurate with their ability to function.

The physical environments in LTC settings are one of the key factors in ensuring good aging. It can also be assumed that a physical environment suitable for the individual may reduce institutionalization as well as decrease the amount of personal assistance required. An older person who has the ability to self-manage and is independent needs less care and nursing, which affects care costs and the number of staff needed. For older people, the physical environment offers the opportunity to live a meaningful and active life both indoors and outdoors.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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