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Wayfinding in the nursing home corridor: facilitating architecture for people with dementia

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ABSTRACT

Engaging in wayfinding behavior is a common activity which takes place several times a day. However, people with advanced dementia experience difficulties in reaching desired destinations, even within their homes, due to declining wayfinding skills. Reaching destinations contributes to their autonomy and quality of life. Architecture—when designed suitably—has the potential to support wayfinding skills. The central question of this article is how nursing home corridors should be designed to facilitate wayfinding behavior of people with advanced dementia. In this state-of-the-art literature review, empirical studies (published between 1981-2025) on design aspects stimulating wayfinding for people with advanced dementia in their inpatient living environment were reviewed. Design requirements on composition, geometry, dimensions, surface properties, openings, lighting, objects, and signage were identified. Requirements such as a well-defined and simple layout, visual accessibility, minimizing changes in directions, avoidance of repetitive spaces, a short length, and uncluttered signage could facilitate wayfinding for this target group. However, until today, still little empirical evidence and knowledge is available on specific requirements for architectural and interior elements to facilitate people with advanced dementia during wayfinding. On top of that, some design requirements contradict each other. Furthermore, potential architectural aspects were discovered in this review. Therefore, this paper concludes with a research agenda to guide further research in dementia-sensitive architecture empowering people with advanced dementia to reach their desired destinations.

Keywords: Architecture; Circulation space; Navigation; Dementia; Nursing Home

1. INTRODUCTION

All day long, people try to reach destinations within their built environment. This requires wayfinding skills. Unfortunately, people with dementia have to cope with cognitive decline, including declining wayfinding skills (Reisberg, et al., 1982). For example, making on route decisions to reach a destination becomes more difficult (Rainville, et al., 2001). Next to this, the ability to construct a mental map of the building declines, and therefore people with (advanced) dementia become more dependent on the built environment they directly perceive (Miniaci & De Leonibus, 2018; Serino, et al., 2014). However, reaching destinations remains important for people with advanced dementia to maintain their autonomy and quality of life (Andersen, et al., 2004; Kleibusch, 2018)

Reaching destinations can be viewed from different perspectives. The (environmental) psychological perspective of reaching destinations is wayfinding. The architectural perspective is the design of the circulation and composition of spaces (Passini, 1996). The spaces' composition and the circulation space's design play an essential role in wayfinding (e.g., Carlson, et al., 2010; Carpman & Grant, 2011), ideally facilitating movement from one space to another. The architecture of these spaces has the potential to support wayfinding and as a consequence enable successfully reaching destinations (e.g., Carbone, et al., 2025).

In this study, we have focused on the architecture of circulation spaces in nursing homes. While the circulation space in family houses is comprised to a minimum square footage (e.g., entrance hall, staircase, landing), the circulation space in nursing homes for people with dementia becomes larger and longer. This is due to the functionality of the building: housing multiple people with private bedrooms and shared living rooms, including facility spaces and spaces for care staff.

We have specifically addressed inpatient facilities where people with (advanced) dementia live. Due to different health care policies, the term of such inpatient facilities differs per country; for example, nursing home, residential care home, long term care facility, and special care unit. In this article, we used the term nursing home as an overarching concept including all the concepts mentioned above. When addressing this specific location people live, we have especially focused on places they are more or less familiar with, because we want to support the autonomy in their living environment. Searching for a destination in a random building, requires the challenging task 'learning new routes' for people with dementia (Lithfous, et al., 2013; Cushman, et al., 2008), asking different skills from people with (advanced) dementia.

Architecture could compensate declining wayfinding skills of people with dementia, but the question arises as to what requirements the circulation space's architecture and interior design should meet to support wayfinding for people with (advanced) dementia. Many (grey literature) studies focus on these

architectural requirements derived from care givers' opinions (e.g., Morgan & Stewart, 1999; Lee, et al., 2016), i.e., talking about the target group, rather than involving them in research. Or studies focus on wayfinding in random (health care and/or virtual) environments (e.g., Cernin, et al., 2003; Davis & Sikorskii, 2020; Passini, et al., 1998), where the role of familiarity of the environment for this target group is excluded. The aim of this study is to gain insight into how the corridor's design can support people with (advanced) dementia during wayfinding in nursing homes, based on empirical research with people with (advanced) dementia in their inpatient living environment.

2. METHODS

A state-of-the-art literature study was conducted on empirical studies in the field of wayfinding, people with (advanced) dementia, and the design of nursing homes. Other researchers (such as Day, et al. (2000), Marquardt, et al. (2014), and Wiener & Pazzaglia (2021)) have earlier studied design for people with dementia, partially focusing on stimulating wayfinding. Their existing literature reviews (published between 2000 and 2022) were selected as starting point for the search (see Appendix I).

The existing literature reviews of Bowes & Bowes (2019), Chaudhury, et al. (2018), Day, et al. (2000), Fleming & Purandare (2010), Marquardt, et al. (2014), and Woodbridge, et al. (2018) focused on people with dementia, design, and well-being, including some paragraphs on wayfinding. The reviews of Davis & Weisbeck (2016) and Wang & Lu (2022) focused especially on cues for people with dementia. The reviews of Ghamari & Sharifi (2021) and Marquardt (2011) concentrated on wayfinding for people with dementia. Lastly, the reviews of Kuliga, et al. (2021) and Wiener & Pazzaglia (2021) were visionary papers about dementia-sensitive architecture for wayfinding for people with dementia.

Original empirical studies were extracted from these existing literature reviews, complemented with a hand-search snow-ball method searching in Google Scholar database (especially to gather original empirical studies published between 2022 and February 2025). Inclusion criteria for the extracted and selected empirical studies were: empirical research, written in English, about people with (advanced) dementia, involvement of people with (advanced) dementia in the research design, inpatient living facility, wayfinding, focus on spatial/interior design aspects, indoor environments, and studies in which research has been conducted in their living environment. Studies only involving staff or families' opinions about wayfinding design qualities, focus on cognitive aspects of wayfinding, and studies in which research has been conducted in random buildings other than the inpatient living environment (e.g., hospital or home setting, outdoor environment, virtual environment) were excluded. The extracted empirical studies from the existing literature studies complemented with the hand-search resulted into fourteen empirical research papers in the current state-of-the-art literature review.

The empirical studies were assessed on their quality, using the framework of Marquardt & Motzek (2013), just as applied in the literature reviews of Marquardt, et al. (2014) and Wang & Lu (2022). Six levels of evidence can be assigned to the empirical studies, summarized: (1) systematic reviews of multiple studies, (2) experimental and quasi-experimental studies, (3) observational studies, (4) professional standards, (5) opinions of recognized experts and case studies, and (6) recommendations from financial biased organizations.

To identify design requirements, the included empirical studies were analyzed on design-related findings based on the following architectural features: composition of spaces, geometry, dimensions, openings, surface properties (e.g., color, material, texture), lighting, objects, and signage (e.g., Ching, 2007; Koolhaas, et al., 2014). These design aspects are basics for architects and they can use them directly to design suitable nursing homes.

3. RESULTS AND ANALYSIS

3.1 Included empirical studies

A total of fourteen empirical studies were included in the review, published between 1981 and 2019. Almost half of the studies was published between 2000 and 2019. Nine studies evaluated a specific design characteristic on wayfinding effectiveness (including actively changing something within the environment), while the others focused on the whole inpatient living environment of the people with dementia. Direct observations (9x) and navigation tasks (6x) were the applied methods in the studies. Sometimes staff interviews were accompanied (e.g., Passini, et al., 2000; van Buuren, et al., 2019).

In eight studies, the stage of dementia was specified, varying from a combination of early to advanced stage, to just advanced stage. The other six studies did not report on the stage of dementia, but participants were living in inpatient care facilities which automatically implies that the dementia affected their lives in such a way that they could no longer live autonomously and independently. The sample size varied between three to 450 participants. In half of the studies, a maximum of ten participants were involved. To each study, an evidence level (Marquardt & Motzek, 2013) was assigned. Table 1 shows an overview of the included empirical studies.

Table 1: Overviewof included empirical studies on wayfinding for people with dementia and the built environment

Author	Year	Title article	Method	Sample - people	Sample - buildings	Type of study	Evidence level	Literature review source*
Hanley	1981	The use of signposts and active training to modify ward disorientation in elderly patients	Navigation task	n=8 *moderate-advanced*	2 wards of long-stay psychogeriatric ward	Experimental study	L2	1, 2, 4, 12
Netten	1989	The effect of design of residential homes in creating dependency among confused elderly residents: A study of elderly demented residents and their ability to find their way around homes for the elderly	Direct observation (by staff) & assessment floorplans	n=104 *moderate-advanced*	6 group homes & 7 communal homes	Observational study	L3	1, 3, 4, 7
Namazi & Johnson	1991	Physical environmental cues to reduce the problems of incontinence in Alzheimer' s disease units	Direct observation	n=44 *early-advanced*	2 dementia units	Quasi-experimental study	L3	1, 2, 3, 4, 7, 8, 10
Namazi, et al.	1991	Long-term memory cuing to reduce visuo-spatial disorientation in Alzheimer' s disease patients in a special care unit	Navigation task	n=10 *moderate-advanced*	1 special care unit	Experimental study	L2	1, 2, 3, 4, 7
Elmstahl, et al.	1997	How should a group living unit for demented elderly be designed to decrease psychiatric symptoms?	Direct observation (pre & post)	n=105	18 group living units	Observational study	L3	1, 2, 3, 4, 6
Passini, et al.	2000	Wayfinding in a nursing home for advanced dementia of the Alzheimer' s type	Navigation task & staff interviews	n=6	1 nursing home	Qualitative study / case study	L3	2, 3, 4, 7, 8, 9, 10, 11, 12
Nolan, et al.	2001	Using external memory aids to increase room finding by older adults with dementia	Navigation task	n=3 *advanced*	1 special care unit of a residential nursing home	Quasi-experimental study	L3	3, 4, 5, 8, 11, 12
Nolan, et al.	2002	Evaluation of the effect of orientation cues on wayfinding in persons with dementia	Navigation task	n=5	1 special care unit, different wards	Quasi-experimental study	L3	3, 5, 6, 11, 12

[Table 1 continued]

Author	Year	Title article	Method	Sample - people	Sample - buildings	Type of study	Evidence level	Literature review source*
Kincaid & Peacock	2003	The effect of a wall mural on decreasing four types of door-testing behaviors	Direct observation (pre-post)	n=12	1 special care unit	Quasi-experimental study	L3	10
Reimer, et al.	2004	Special care facility compared with traditional environments for dementia care: a longitudinal study of quality of life	Direct observation & tasks	n=185	24 long-term care centers, 4 assisted living environments	Experimental study	L2	4, 8
Marquardt & Schmieg	2009	Dementia-friendly architecture: Environments that facilitate wayfinding in nursing homes	Direct observation (by staff)	n=450 *91 mild, 183 moderate, 176 advanced*	30 nursing homes	Observational study	L3	3, 8, 9, 10, 11
Ilem & Feliciano	2018	Finding your way home: A systematic investigation of shadowboxes on room recognition in memory care	Direct observation, with interventions (pre-post)	n=6 *moderate-advanced*	1 long-term care	Experimental study	L2	11
van Buuren, et al.	2019	Evaluating Three Validation-Methods for an Architectural Intervention for Seniors with Dementia in the Empathic Design Framework, a Case Study	Direct observation, with interventions; navigation task & staff interviews (pre-post)	n=22 *advanced* (method: navigation) n=16 *advanced* (method: observation) n=14 staff	1 nursing home; multiple wards for WF task & interview, observation in 1 ward	Quasi-experimental study	L3	13
Varshawsky & Traynor	2019	Graphic designed bedroom doors to support dementia wandering in residential care homes: Innovative practice	Observation, with interventions (pre-post)	n=9	1 nursing home	Quasi-experimental study	L3	12

*1. Day, et al. (2000); 2. Fleming & Purandare (2010); 3. Marquardt (2011); 4. Marquardt, et al. (2014); 5. Davis & Weisbeck (2016); 6. Chaudhury, et al. (2018); 7. Woodbridge, et al. (2018); 8. Wiener & Pazzaglia (2021); 9. Bowes & Bowes (2019); 10. Ghamari & Shariffi (2021); 11. Kuliga, et al. (2021); 12. Wang & Lu (2022); 13. Hand search

3.2 Analysis of the design requirements

Identified design requirements on composition, geometry, dimensions, openings, surface properties, lighting, objects, and signage stimulating wayfinding for people with (advanced) dementia living in inpatient care facilities are displayed in Table 2. Some requirements were derived from multiple studies; for example, the usage of meaningful and simple decision moments (Marquardt & Schmieg, 2009; Netten, 1989; Passini, et al., 2000). Sometimes, the empirical studies were contradictory in the requirement; for example the effectiveness on the use of distinctive doors (van Buuren, et al., 2019; Varshawsky & Traynor, 2019).

Table 2: Overview of architectural and interior design characteristics on supporting wayfinding for people with (advanced) dementia in inpatient care facilities

Characteristic	Requirement	Source	Sample	Level of evidence
n.a.	In the empirical studies, varied conclusions were drawn on the dependency of scale and spatial orientation. Both Marquardt & Schmieg (2009) (n=450, evidence level 3) and Passini, et al. (2000) (n=6, evidence level 3) mentioned that a small scale should support spatial orientation. However, Reimer, et al. (2004) (n=185, evidence level 2) did not find a relationship between both.	Marquardt & Schmieg, 2009 Reimer, et al., 2004 Passini, et al., 2000	n=450 n=185 n=6	3 2 3
	Clearly legible spaces should be provided, by means of functions, size, proportion, materiality, and furnishing.	Marquardt & Schmieg, 2009	n=450	3
Composition of spaces / zoning / layout	Meaningful and simple decision moments, in which environmental information is readily accessible, are essential. They should allow people with dementia navigate from decision point to decision point. Positioned at places where the direction changes. They can become memorable by specified functions (e.g., kitchen), fixtures, fittings, and furniture.	Passini, et al., 2000 Netten, 1989 Marquardt & Schmieg, 2009	n=6 n=104 n=450	3 3 3
	Minimize changes in directions.	Marquardt & Schmieg, 2009	n=450	3
	Make sure that the endings of corridors are clearly visible. Avoid cul-de-sacs, but activity spaces can be positioned at the end of corridors.	Marquardt & Schmieg, 2009	n=450	3
	Provide visual access towards the main destinations.	Passini, et al., 2000 Marquardt & Schmieg, 2009	n=6 n=450	3 3
	The living room should be positioned on a remarkable place. And if multiple living rooms are necessary, they should be positioned next to each other.	Marquardt & Schmieg, 2009	n=450	3
	The entrance towards an accessible outside area should be located at a central place.	Marquardt & Schmieg, 2009	n=450	3
	Try to provide all relevant functions for the residents on one floor, since elevator usages can act as major anxiety causing barrier.	Passini, et al., 2000	n=6	3
Geometry	Provide well-defined, geometrically simple structures. But avoid monotony architecture and repeated spatial situations and places. Make use of articulated architecture.	Marquardt & Schmieg, 2009 Passini, et al., 2000 Netten, 1989	n=450 n=6 n=104	3 3 3
	Different conclusions about the shape of the corridor. Elmstahl, et al. (1997) (n=105, evidence level 3) discovered that L, H, square-shaped corridors might be more supportive for wayfinding (only 4 cases against 14 I shaped); while Marquardt & Schmieg (2009) (n=450, evidence level 3) indicated straight corridors or I-shaped corridors.	Elmstahl, et al., 1997 Marquardt & Schmieg, 2009	n=105 n=450	3 3
	Make use of guiding features in shape.	Marquardt & Schmieg, 2009	n=450	3
Dimensions	Length: straight corridors should be interrupted by reference points.	Marquardt & Schmieg, 2009	n=450	3
	Length: short routes.	Netten, 1989	n=104	3
	Width: wider corridors might facilitate orientation.	Elmstahl, et al., 1997	n=105	3
Openings	Minimize the amount of doors (and exit points) on the route in the corridor.	Netten, 1989	n=104	3
Surface properties	Avoid floor patterns and dark lines.	Passini, et al., 2000	n=6	3
	Wall murals might be used to hide exit doors.	Kincaid & Peacock, 2003	n=12	3
	Literature is inconclusive about the effectiveness on wayfinding of distinctive doors. In the study of van Buuren, et al. (2019) (n=22, evidence level 3), no difference between 'normal' and 'distinctive' doors was found, while in the study of Varshawsky & Traynor (2019) (n=9, evidence level 3) a small improvement was observed.	van Buuren, et al., 2019 Varshawsky & Traynor, 2019	n=22 n=9	3 3
Lighting	The more light, the better wayfinding.	Netten, 1989	n=104	3
Objects / furniture	Memory boxes located near the individual bedroom, might enhance wayfinding. They should be visible from all directions on the route, and the things displayed should be unchanged. The items should be large and easily visible, with distinctive and unique character.	Namazi, et al., 1991 Ilem & Feliciano, 2018 Nolan, et al., 2002	n=10 n=6 n=5	2 2 3

	Literature is inconclusive if the items in the memory box should be personalized or not. The study of Namazi, et al. (1991) (n=10, evidence level 2) mentioned no clear evidence on personalization, while the study of Ilem & Feliciano (2018) (n=6, evidence level 2) mentioned that personalized items reflecting the resident's history and interest are preferred.	Namazi, et al., 1991	n=10	2
		Ilem & Feliciano, 2018	n=6	2
	Make use of general landmarks to distinguish spaces.	Ilem & Feliciano, 2018	n=6	2
Signage	Make use of signage. Preferably in combination with 3 training.	Passini, et al., 2000	n=6	3
		Marquardt & Schmieg, 2009	n=450	3
		Hanley, 1981	n=8	2
	The signage should be uncluttered.	Passini, et al., 2000	n=6	3
	Combination of cues are recommended by different studies. Namazi & Johnson (1991) (n=44, evidence level 3) suggested a combination of words and arrows. The studies of Nolan, et al. (2001, 2002) (n=5 and n=3, both evidence level 3) suggested a portrait photo, name, and personal memorabilia.	Namazi & Johnson, 1991	n=44	3
		Nolan, et al., 2002	n=5	3
		Nolan, et al., 2001	n=3	3
	Printed names should be in large font (at least 72 pt) and with high contrast.	Ilem & Feliciano, 2018	n=6	2
	Portrait pictures might support wayfinding. Both the study of Nolan, et al. (2001) (n=3, evidence level 3) as Ilem & Feliciano (2018) (n=6, evidence level 3) suggested to use pictures from the early stage of life of the resident. Preferably with unique features.	Nolan, et al., 2002	n=5	3
			n=3	
		Nolan, et al., 2001	n=6	3
		Ilem & Feliciano, 2018		2
	The pictures should be enlarged. Ilem & Feliciano (2018) (n=6) suggested 8 x 10.	Ilem & Feliciano, 2018	n=6	2

4. DISCUSSION

4.1 Discussion on the included empirical studies

In this state-of-the-art literature review, we identified requirements for architectural and interior aspects of corridor designs of nursing homes, in which wayfinding is stimulated for people with (advanced) dementia. Therefore, we examined fourteen empirical studies on this theme. Remarkably, to the best of our knowledge, no empirical studies with people with advanced dementia in their inpatient living environment studying design in relation to wayfinding were found after 2019. We did identify literature reviews on this topic after 2019 which were included in our search strategy on empirical studies (e.g., Wiener & Pazzaglia, 2021; Wang & Zu, 2022), some studies in other environments (such as: VR (Davis & Sikorskii, 2020), outdoor (Seetharaman, et al., 2020), short stay facilities (Shum, et al., 2025), laboratory

(Tuaycharoen, 2020)), or studies involving only expert and care staff opinions (Alam & Kim, 2023). A possible speculative explanation could be that due to the COVID-19pandemic (pandemic status from 2020-2023 (World Health Organisation, 2025)) it was impossible to conduct research with this vulnerable target group in nursing homes for a couple of years.

This state-of-the-art review differed from other existing literature reviews (e.g., Day, et al., 2000; Marquardt, et al., 2014; Wiener & Pazzaglia, 2021) on two aspects. First, only empirical studies were included, involving participation of people with (at least advanced) dementia. Second, the research setting was the inpatient living environment of the people with (advanced) dementia themselves, rather than a random other health care building or virtual environment.

The second aspect might clarify why no cognitive healthy control groups were included in the research designs. We focused on familiar environments and not the challenging task of 'learning new routes' in unfamiliar environments (Lithfous, et al., 2013). Next to this, it is also a bit odd to invite cognitive healthy people to participate in the living environment of others. Whereas the research designs of the included empirical studies was relatively high (levels 2 and 3 out of 6), the sample size was in the majority of the studies rather small. This influences the generalizability of the findings.

4.2 Discussion on the identified requirements

In fact, very little research has been conducted on architectural features facilitating wayfinding with people with (advanced) dementia in their inpatient living environment. In our study, we excluded (among others) studies conducted with people with early stages of dementia, studies in which wayfinding and design were assessed in other health care buildings, studies with only expert and staff opinions involved, and studies assessing the floorplan. However, these excluded studies, including grey literature from practice, might provide potential additional requirements. In the following paragraphs, we take a closer look at these potential additional requirements, focusing on the architectural themes composition, geometry, dimensions, openings, surface properties, lighting, objects, and signage; besides the relationship between scale and spatial orientation.

The included empirical research was inconclusive about the relationship between scale and spatial orientation. A grey literature study (van Liempd, et al., 2009) did not find this relationship as well. Furthermore, grey literature (e.g., Nillesen & Optiz, 2013), studies conducted in other health care settings (Passini, et al., 1998), and studies involving expert and staff opinions (Zeisel, et al., 2003) do underline the importance of clearly and legible spaces. Additionally, they mention to design clear destinations (Zeisel, et al., 2003) and a clear lay-out (Aedes-Actiz, 2018). Furthermore, a study with staff opinions suggests using multisensory design with sound and smell as well to enhance wayfinding (Alam & Kim, 2023).

Concerning composition of spaces, included empirical studies indicate minimizing changes in directions, the position of the living room at the remarkable place, and all relevant functions on one floor. Meaningful and simple decision moments, visual accessibility, clearly visible endings of corridors are underlined by studies conducted in other health care settings, expert and staff opinions, and grey literature (e.g., Alam & Kim, 2023; de Vos, 2013; Passini, et al., 1998; Warner, 2000). Grey literature and studies with only staff involved also mentions a homelike sequence of places (e.g., de Vos, 2013), a walking circuit (e.g., Nillesen & Optiz, 2013), and only accessible spaces along the route (Zeisel, et al., 2003).

The geometry of the circulation spaces should – according to the included studies – be articulated, well-defined, and simple. Grey literature (e.g., Brawley, 1997; Cohen & Weisman, 1991), studies involving other health care settings (Passini, et al., 1998), and studies with early and middle stages of dementia (Faith, et al., 2015) underline this. The included empirical studies were inconclusive about the shape of the corridor. While Elmstahl, et al. (1997) recommend L, H, or square-shaped corridors, Marquardt & Schmieg (2009) recommend I-shaped corridors with little changes in directions as possible. In the assessment study of van Buuren & Mohammadi (2022) as well as based on expert and staff opinions (Zeisel, et al., 2003), the straight corridor was also highly recommended for wayfinding purposes. In a study with early and middle stages of dementia, T-junctions should be avoided (Faith, et al., 2015). The included empirical studies also highlight the use of guiding features in the shape. Additionally, potential other factors related to geometry are sightlines (Zeisel, et al., 2003) and the transition between spaces (Nillesen & Optiz, 2013).

The included empirical studies did not heavily study the dimensions of the corridor. The studies recommend short and wide corridors. Greyliterature (e.g., van Liempd, et al., 2009) and an assessment study (Morgan, et al., 2004) also recommend short corridors. Staff opinions and cognitive wayfinding studies underline the wide corridors. Zeisel, et al. (2003) recommend a width in which two people can pass each other; and Caspi (2014) suggest a width in which one is able to oversee the corridor at once.

Openings in architecture – such as doors and windows – were rarely empirically studied in the field of wayfinding, design, and people with (advanced) dementia. The requirement of minimizing the amount of doors is also underlined by grey literature (e.g., de Vos, 2013). Windows allowing direct daylight might enhance wayfinding as well, according to expert and staff opinions (Zeisel, et al., 2003), grey literature (Nillesen & Optiz, 2013), and studies in other types of environments (Tuaycharoen, 2020). “Interior windows” allowing visual access between corridors and other spaces such as the living room, might be beneficial for wayfinding purposes as well (Woonzorg Nederland, et al., 2024).

Surface properties were also rarely empirically studied with people with dementia stimulating wayfinding in inpatient living facilities. Whereas included empirical studies discourage floor patterns and dark lines, grey literature on the one hand underlines this (van Liempd, et al., 2009), at the other hand encourages to make use of differences in floor finishing (Aedes-Actiz, 2018; Pollock & Fuggle, 2013), and expert and staff opinions as well (Alam & Kim, 2023). One included empirical study recommended wall murals to hide exit doors. Two included empirical studies report contradicting effectiveness on the use of distinctive doors. An expert and staff opinion study (Alam & Kim, 2023) does recommend the use of distinctive doors.

Furthermore, the included study of Passini, et al. (2000) did not find a relationship between color and wayfinding. Cooper, et al. (1989) underline this; while a study involving staff opinions (Lawton, et al., 1984), study involving people with early stage dementia (Gibson, et al., 2004), and grey literature (Brawley, 1997) do recommend color use in relation to wayfinding. Cernin, et al. (2003) recommend bright colors based on recognition tasks. Crow, et al. (2003) advocates contrast in color use based on evaluations in other health care settings. Wijk & Sivik (1995) prescribes red-yellow tones instead of blue-green colors, based on evaluations other than nursing homes.

The empirical study of Netten (1989) was the only included study reporting on the benefits of lighting in corridors to support wayfinding. This finding is underlined by studies not assessing wayfinding in particular, but other activities of daily life (Brush, et al., 2015; Cohen-Mansfiel & Parpura-Grill, 2007; Kim, et al., 2021), review article on technology and wayfinding (Caffó, et al., 2014), and grey literature (Figuero, 2013; van Liempd, et al., 2009).

The object “memory box” is recommended by three empirical studies. Although the review studies by Day, et al. (2000), Fleming & Purandare (2010), Marquardt (2011), Marquardt, et al. (2014), and Woodbridge, et al. (2018) incorporated the work of Namazi, et al. (1991) on this topic, they differ in the interpretation of the findings. Woodbridge, et al. (2018) indicated that no association was found between memorabilia and finding one’s room, and Fleming & Purandare (2010) discovered a ‘weak’ association, while Marquardt (2011) adopts the guideline that personal items at the entrance door of one’s room are conducive in wayfinding. The empirical studies are inconclusive about the personalization of these memory boxes. However, grey literature (de Vos, 2013), a study conducted in other health care settings (Gross, et al., 2004), and based on experts and staff (Zeisel, et al., 2003), recommend friendly, homelike, and recognizable entrance doors; possibly accompanied with personalized memory boxes.

Landmarks as objects are often recommended in research concerning wayfinding. One included empirical study also advocates this for people with (advanced) dementia in nursing homes. This

finding is underlined by the study of Passini, et al. (1998) executed in a hospital and the studies of Zeisel, et al. (2003) and Alam & Kim (2023) executed with staff.

Lastly, requirements for signage include making use of signs, no cluttering of signs, a combination of cues, printed name tags, and portrait pictures. These findings are also recommended by studies executed in other (health care) settings (Brush, et al., 2015; Cogné, et al., 2018; Davis & Ohman, 2016; Davis, et al., 2017; Motzek, et al., 2016; Passini, et al., 1998; Scialfa, et al., 2008; Yong, et al., 2018). Scialfa, et al. (2008) recommend simple signs and Davis, et al. (2017) recommend colorful and familiar signs. Studies without people with advanced dementia, recommend the usage of high contrasts in signs (Brush, et al. 2015) and the use of room numbers (Gibson, et al., 2004). Lastly, in the empirical study of Namazi & Johnson (1991), staff recommends the place the signage on eye-level of the residents.

The included empirical studies were inconclusive about four requirements of architectural aspects: relationship between scale and spatial orientation, the shape of the corridor, the usage of distinctive doors, and personalization of memory boxes. In addition, the included empirical studies in combination with the excluded and additional studies, raised inconsistencies about floor patterns and the relationship between color and wayfinding. Furthermore, little empirical research with people with (advanced) dementia in their inpatient living environment concerning wayfinding is conducted about dimensions (length, width, and height), openings (especially windows), lighting (especially daylight), and surface properties (such as materials and colors). Moreover, potential facilitating architectural features might be the sequence of spaces, the presence of a walking circuit, the use of sightlines, the design of the transition between spaces, windows towards the outside, and interior windows.

4.3 Research agenda

Until today, still little empirical evidence and knowledge is available on specific requirements for architectural and interior elements to facilitate people with advanced dementia during wayfinding. On top of that, some recommendations on design requirements seem to contradict each other. These contradictions might arose from variations in methodology, setting, or target group, and this highlights the need for project-specific design solutions rather than generic guidelines. Furthermore, potential architectural aspects were discovered in this review. It is essential to continue empirical research to understand the inconsistencies and potential architectural aspects. Therefore, we formulated a research agenda to guide further research in dementia-sensitive architecture empowering people with advanced dementia to reach their desired destinations.

Potential requirements concerning composition, such as the sequence of spaces and the influence of a walking circuit in relation to wayfinding, could be examined in future research. Furthermore, regarding geometry, the most facilitating shape of the corridor is still unknown. On the one hand, changes of direction should be minimized, while on the other hand, some studies advocate L- or H-shaped corridors with distinctive decision moments. This is an interesting paradox: trying to minimize decision moments because making decisions becomes harder, while remarkable places such as changes in directions are also recommended. Future research could be conducted on the role of a decision moment being both remarkable and an easy choice moment. Furthermore, potential requirements such as sightlines and the design of transition areas could be examined.

On dimensions, a short straight corridor is suggested by some empirical research and long corridors should be avoided. Future research could dive into the moment a straight corridor becomes disorienting; from the perspective of the perception of length as well as the p hysical distance to be covered. This is an interplay between length, width, and height. Furthermore, future research could be conducted on narrowing and widening the corridor, and height differences. Moreover, the influence of openings – both windows to the outside and “interior windows” – might be studied in depth.

Regarding surface properties, contradicting findings on the usage of distinctive doors, floor patterns / floor finishes, and the relationship between color and wayfinding could be further examined with people with advanced dementia in their inpatient living environment. Furthermore, more empirical research could be conducted on the effects of lighting on wayfinding. Objects, such as personalized memory boxes, could also be studies with larger sample sizes. Lastly, future research could dive into the additional value of a signage system when the architecture of nursing home corridors speaks for itself in facilitating people with advanced dementia in reaching destinations in their inpatient living facility.

However difficult, it would be essential if these matters will be investigated in the inpatient living environment of people with advanced dementia; and not in another random building. Because, in a new place, one might use different spatial/interior information than in their familiar environment.

5. CONCLUSION

Architecture has the strength to support decreasing wayfinding skills of people with (advanced) dementia, only if designed properly, allowing people with (advanced) dementia to navigate from one remarkable point to another. The composition of nursing home corridors for people with (advanced) dementia supporting wayfinding should be simple, with visual access towards important legible spaces, and with as little changes in direction as possible. The created decision points – due to these direction changes – should contain readily available environmental information to make decisions. Geometrically, the circulation space should be well-defined, and avoid repeated places. The length should be short and the width wide enough to provide overview. The amount of doo r openings in the

corridor should be minimalized. Items that might help wayfinding are memory boxes near door openings of individual bedrooms; which should be visible from all direction approaches. Uncluttered signage in words and arrows on eye-level,might be added in the nursing home corridor, to assist the architecture.

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APPENDIX I.

Table 1: Overview of existing literature reviews

Authors	Year	Title	Published in:	Aim	Method	Timeframe	Sample
Day, et al.	2000	The therapeutic design of environments for people with dementia: a review of the empirical research	The gerontologist	To enhance the design of dementia facilities and to provide direction for future research.	Review of empirical research Additional handsearch	1980 – 2000	71
Fleming & Purandare	2010	Long-term care for people with psychogeriatrics recommendations empirical between 332 dementia: to assist people research 1981-2010 environmental with dementia in Additional Based upon design long-term care hand- Day, et al., guidelines	International	Identify design facilities, and assess their evidence strength.	Review of search	Probably 63 of 2000	
Marquardt	2011	Wayfinding for people with dementia: a review of the role of architectural homes.	HERD:Health Environments Research & Design	Provide overview of available literature on architectural wayfinding design for people with dementia in nursing design	Review of literature	unknown	5
Marquardt, et al.	2014	Impact of the design of the built environment on people with dementia: an evidence-based review	HERD:Health Environments Research & Design	Review and rate available literature	Systematic review Additional hand-search	1980 – Feb 2013	169 of 2642
Davis & Weisbeck	2016	Creating a supportive environment using cues for wayfinding in dementia	Journal of Gerontological Nursing	Determining qualities of environmental cues or landmarks that impact wayfinding for older adults with and without dementia.	Literature study	2000 - 2015	8 of 236
Chaudhury, et al.	2018	The influence of the physical environment on residents with dementia in long-term care settings: a review of the empirical literature	The gerontologist	Provide an overview of the empirical work on architecture of longterm care facilities for people with dementia; and present a preliminary discussion linking empirical findings and therapeutic goals.	Narrative literature study Additional handsearch	2000 – 2018	103 Based upon Day, et al., 2000
Woodbridge, et al.	2018	Use of the physical environment to support everyday activities for people with dementia: a systematic review	Dementia	Identify how bodily performance in everyday activities is supported by evidence-based design research.	Systematic literature	Until March 2015	72 of 869
Wiener & Pazzaglia	2021	Ageing- and dementia friendly design: theory and evidence from neuropsychology can contribute to guidelines that minimize spatial disorientation	Cognitive processing	Provide evidencebased design guidelines reducing spatial disorientation and support wayfinidng for people with dementia in longterm care facilities; based on different disciplines.	Targeted literature review Additional handsearch	unknown	unknown
Bowes & Bowes	2019	Designing environments for people with dementia: A systematic literature review	*eBook*	Provide an overview of existing literature on supportive spatial environments for people with dementia.	Systematic literature review	1990 - May 2015	173 of 11378
Wang & Lu	2022	Influences of environmental cues on people with dementia: A scoping review.	Journal of physical Gerontology	Applied			
Ghamari & Sharifi	2021	Mapping the evolutions and trends of literature on wayfinding in indoor environments	European Journal of Investigation in Health, Psychology and Education	Present a bibliometric analysis of about 40 years of research on indoor wayfinding. Provide an overview of evidence of effectiveness of environmental cues for people with dementia; and identify research gaps in this field.	Bibliometric analysis Additional hand-search	1965unknown	407 of 1451

Kuliga, et al.	2021	Wayfinding in people with Alzheimer's disease: perspective taking and architectural cognition—a vision paper on future dementia care research opportunities	Sustainability	Discussing the current literature on dementia-sensitive built spaces, in the context of supporting wayfinding and spatial orientation.	Targeted literature review	unknown	unknown
Scoping review Additional handsearch	1980 - 2021	26	2555				