"Feeling at home" for people with dementia in care environments: the role of built environment factors. A critical literature review

"Sentirse como en casa" para las personas con demencia en entornos asistenciales: el papel de los factores del entorno construido. Una revisión crítica de la literatura

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ABSTRACT: This review summarises the challenges of applying evidence that built environment factors contribute to people with dementia feeling at home in long-term care institutions. Eighteen reviewed publications are classified into research-focused and practice-focused study. Research-focused studies from scientific epistemology focus on physical environment aspects that influence residents feeling at home in the care institution. Design-focused studies develop specific design strategies based on evidence from research-focused studies. However, there are limitations in transforming research evidence into design practice due to a mismatched knowledge foundation. Future research should consider standing on design epistemology to gain new insights which reflect built environment contributions to the sense of home for people with dementia living in care institutions by Research through Design approach.

KEYWORDS: Dementia; Sense of home; Care institution; Built Environment; Design Practice

RESUMEN: La presente revisión resume los desafíos de la aplicación, a la practica del Diseño, de las evidencias que los factores del ambiente construido contribuyen a que las personas con demencia perciban el sentido del hogar dentro de un centro de cuidado de ancianos. Diecisiete publicaciones has sido revisadas y clasificadas según fueran estudios basados en la investigación, o basados en la practica del diseño. Los

estudios basados en la investigación, derivado de la epistemología científica, se enfocan en los aspectos del ambiente físico que influencian el sentido del hogar en los residentes de centro de cuidado de ancianos. Los estudios basados en la practica del diseño, desarrollan especificas estrategias basadas en evidencia de los estudios basado en la investigación. Sin embargo, en la transformación de evidencia, proveniente de la investigación, en practica de diseño, hay limitaciones debida a discordancia entre conocimiento de base y presentación de la evidencia. La investigación futura podría considerar la posibilidad de situarse en la epistemología del diseño para obtener nuevos conocimientos que inspiren la práctica del diseño mediante el enfoque de la investigación a través del diseño.

PALABRAS-CLAVE: Demencia; Sentido del Hogar; Centro de cuidado de ancianos; Ambiente construido; Practica de Diseño

1. Introduction

The design of long-term care facilities is nowadays regarded as a therapeutic aid, able to enhance well-being among people with dementia (PWD). Inside this perspective, the environment can reduce dysfunctional symptoms and behaviours (Zeisel & Raia, 2000), gaining a therapeutic value in the enhancement of the quality of life among PWD (Day et al., 2000; Cody et al., 2002). Therefore, the physical environment assumes a “prosthetic” value, as it is able to compensate for some cognitive deficits (Zeisel & Raia, 2000) enhancing the residual capabilities of the person. As suggested by Barrett and colleagues (2019), design principles such as appropriate level of stimulation, clear sequencing in interiors and the provision of adaptable personalized spaces can positively enhance well-being and comfort of PWD living in a long-care environment. Inside this framework, the use of non-institutional design features is frequently recommended, such as home-like furnishings, in order to promote recognition of the spaces by PWD. In fact, dementia care has experienced a shift from a medical model to a social model in recent decades. The social model encourages the treatment of PWD as individuals with unique identities and highlights personal choice and autonomy (Kitwood, 1997). Thus, under the concept of person-centred care, the traditional medical-style institution has transformed into a home-style care institution. This shift has established a focus on the small-scale, the number of residents, the home-style features, and the meaningful activities centred around the daily household (Verbeek et al., 2009). Existing research has recognised that built environment factors, including private spaces, personal belongings, public spaces, look and feel, outdoors, and technology (Rijnaard et al., 2016), are among the most critical elements for residents living in care settings to develop a sense of home. The meaning of home has different explanations in different research areas. For residential care, the sense of home is related to feelings of attachment – attachment to place, to space and attachment beyond the institution (Falk et al., 2013). However, there has been little discussion (Eijkelenboom et al., 2017) on how these factors can be used in design practice. The purpose of this article is to review current publications about built environment factors contributing to the development of a sense of home for PWD living in care settings and critically analyse them according to research categories and research findings. Moreover, understanding these aspects is beneficial to identifying inspiring insights which can represent the starting point for the development of effective design strategies.

2. Methods

This systematic review followed PRISMA guidelines (Moher et al., 2009). First, it scanned five electronic databases, including CINAHL, PsycINFO, PubMed, Scopus, and Web of Science, to find references mentioning built environment contributions to the development of the feeling of home for PWD living in long-term care facilities. The searching term includes three groups of keywords like "meaning of home", "care institution", "built environment", and searched using appropriate synonyms. The publications selected for review had to meet the following inclusion criteria: (1) Original and peer-reviewed publications in English from 2000 until 2020 were included in the review; (2) Publications aiming at defining which specific features and how built environment and related design strategies influence the feeling of home in long-term care institutions or involve associated ideas; (3) The research objectives should include PWD. A total of 469 searching results were generated from the five databases, and 18 studies included in this review based on inclusion criteria. Table 1 describes the abstracts of these studies.

Study	Source of evidence	Methodology	Findings
De Veer &Kerkstra (2001)	Residents, Relatives	Interview	Opportunity to speak to someone in private.
Hauge & Kristin (2008)	Residents	Observation & Interview	Clear boundary between private and public space.
Verbeek et al. (2009)	Previous publications	Literature review	Small-scale; Private room; Technology; Exclude institutional features.
Robinson et al. (2010)	Relatives	Focus groups	curtains and artwork; Private room; Cottages, Small-scale Living; Clean.
Molony (2010)	Previous publications	Literature review	“An experience of dynamic person-place integration”.
Zadelhoff et al. (2011)	Residents, Relatives and staff	Observation & Interview	Privacy; Feeling comfortable.
Lewinson et al. (2012)	Residents	Observations, Interviews &	Furniture and photographs; Holiday decorations; Hair salon and computer stations; Clean.

		Photovoice	
Van Steenwinkel et al. (2012)	Residents	Conceptual framework & Case study	A dynamic balance between autonomy and security.
Falk et al. (2013)	Residents	Grounded theory	Furniture; Personal belongings; Shared spaces.
Marquardt et al. (2014)	Previous publications	Literature review	Living room; Kitchen; Dining room; Homelike furnishings; personalize their surroundings.
Van Hoof et al. (2015)	Residents	Photography and in-depth interviews	Views from the building; Decorating own room; Drawings; Private place; Living room; Accessibility; Shop; TV.
Fleming et al. (2015)	Residents, Relatives and staff	Focus group conversations	Possessions give familiar feeling; Private room & bathroom; Technology as a means of remaining connected to others.
Van Hoof et al. (2016)	Residents, relatives and staff	Photography, interviews and focus groups	Private room; Own spot in the communal space; Paintings and photographs; Rugs, candles, flowers nice placemats; Outdoors; Safety; Inviting meeting points; Accessibility; Wi-Fi; Light level.
Rijnaard et al. (2016)	Previous publications	Literature review	The private space; Public space; Personal belongings; Technology; Look and Feel; Outdoors and Location.
Eijkelenboom et al. (2017)	Previous publications	Literature review	Private space; Public space; Personal belongings; Look and feel; Outdoors and location.
Fleming et al. (2017)	Previous publications	Literature review	Own bedroom; Personal possessions; Living room as public space; Higher lighting levels.
Weeks et al. (2017)	Residents, relatives and friends of residents	Mixed-methods study	Layout; Private rooms and bathrooms; Public spaces; Spaciousness and brightness.
Wada et al (2019)	Residents, relatives and staffs	Semi-structured interviews	Personal items; Television room, en-suite bath, kitchen; Shared space; Outdoor; Larger, cleaner, brighter.

Table 1 – Characteristics of the 18 reviewed publications.

3. Results

Concerning the research categories identified in this article, reviewed publications indicate that current studies follow the Evidence-focused Design (EBD) approach, defined as a design based on the best available evidence from credible research (Hamilton, 2007). According to this definition, 17 reviewed studies can be classified into the research-focused and only 1 represents a practice-focused study. The research-focused studies, which stands on the scientific field, tends to be more concerned with the analysis of physical environmental features. In contrast, the design-focused study, mainly develops specific design strategies for practice. Concerning methods, in the research-focused studies, the majority adopt qualitative research methods, such as observations and interviews, which collect the data from residents who live in care facilities, relatives, care staff, and then analysed qualitatively. Only 3 of them choose PWD as objects for observations and interviews (Hauge & Kristin, 2008; Lewinson et al., 2012; Van Hoof et al., 2015); 4 studies include information from relatives and nursing professionals (De Veer & Kerkstra, 2001; R. Fleming et al., 2015; Robinson et al., 2010; Van Zadelhoff et al., 2011). Due to cognitive impairments, 3 reviewed studies incorporate technical aids (photography, photovoice) into the observations and interviews by asking participants to operate a camera to capture scenes that make them feel at home (Lewinson et al., 2012; Van Hoof et al., 2015, 2016). In contrast to traditional observations and interviews, Falk et al. (2013) uses grounded theory method based on data which were gathered using face-to-face interviews. Another 4 studies provide a comprehensive analysis of the environmental factors that influence the feeling of home by a literature review (A. Fleming et al., 2017; Molony, 2010; Rijnaard et al., 2016; Verbeek et al., 2009). Furthermore, 1 study identifies a framework of essential elements influencing the feeling of home for PWD and explores related physical environment aspects based on the case study (Vansteenwinke et al., 2012). In addition to the qualitative approach described above, Weeks et al. (2017) use a mixed-methods approach: firstly, the participants completed a survey, and the preliminary results were used to guide the implementation of the focus groups. In all the reviewed literature, there is only 1 practice-focused study which discusses how to incorporate evidence from research-focused studies in developing design guidelines in practice. Specifically, Eijkelenboom et al. (2017) addressed a series of design strategies used to design a demonstration apartment. It proposes systematic design guidelines applied for different care environments, including entrance and adjacent spaces, living room, kitchen, bedroom and bathroom. Indeed, this article presents 3 types of findings related to: (1) tangible physical environment, (2) intangible environmental features, and (3) holistic concept. The first 2 aspects are almost in line with earlier findings by Rijnaard et al. (2016), and the third one has a different understanding of results.

3.1. Tangible Physical environment

Personal belongings. In reviewed publications, personal belongings are essential in developing and maintaining a feeling of home for PWD in long-term care institutions. Many studies underline how personal belongings enable a sense of familiarity, identity and encompass memories (Falk et al., 2013; A. Fleming et al., 2017; Lewinson et al., 2012; Van Hoof et al., 2015, 2016; Wada et al., 2020). In the study by Falk et al. (2013), the meaning of home is anchored in physical objects that transform a care environment into a familiar place strengthening self-identity and memories. A number of articles find that residents' personal belongings enhance a sense of familiarity in care facilities, allowing PWD to quickly adapt to the new environment (R. Fleming et al., 2015; Wada et al., 2020). Memorabilia, such as furniture from the previous home, photographs, paintings of descendants, represented their life histories (Lewinson et al., 2012), memories of loved ones (Van Hoof et al., 2015) and reminded people of their past (Van Hoof et al., 2016). In addition, these personal items enhance residents' sense of identity and self-expression (A. Fleming et al., 2017).

Domestic environment. 8 papers in this review describe the supportive role of the domestic environment in creating a feeling of home in long-term care institutions (Falk et al., 2013; Lewinson et al., 2012; Robinson et al., 2010; Van Hoof et al., 2015, 2016; Verbeek et al., 2009; Wada et al., 2020; Weeks et al., 2017). The domestic environment reflects in two aspects: deinstitutionalisation and personalization of care facilities. Verbeek et al. (2009) recommend excluding traditional institutional features by avoiding long corridors, nurses' station and medication charts. Deinstitutionalised facilities tend to mimic the layout of a home (Weeks et al., 2017) encompassing a television room, en-suite bath, kitchen (Wada et al., 2020). Personalising residents' room by decorating rooms according to their preferences is another way to feel at home (Van Hoof et al., 2015), for example, putting curtains and artworks up (Robinson et al., 2010), displaying furniture and memorabilia (Falk et al., 2013), decorating rugs, candles, flowers, colours and nice placemats in the room (Van Hoof et al., 2016).

Private space & Public space. For PWD, private spaces like a private bedroom and bathroom are key elements for maintaining the feeling of home in long-term care facilities (A. Fleming et al., 2017; R. Fleming et al., 2015; Robinson et al., 2010; Van Hoof et al., 2015; Van Zadelhoff et al., 2011; Verbeek et al., 2009; Wada et al., 2020; Weeks et al., 2017) as they provide a sense of privacy. In addition, a private spot in the communal space can also provide a sense of home and privacy (Van Hoof et al., 2016). However, De Veer and Kerkstra (2001) believe that creating opportunities to speak to someone in private and decreasing the disturbance caused by other residents is a critical factor for feeling at home. Apart from private space, public space is also considered as one of the demanding factors. Public areas, such as the shared spaces, common living rooms and inviting meeting points, contribute to social interactions between residents, relatives and nursing staff, enhancing a feeling of home in long-term care institutions. (Falk et al., 2013; A. Fleming et al., 2017; Van Hoof et al., 2015, 2016; Van Zadelhoff et al., 2011; Wada et al., 2020; Weeks et al., 2017).

Building setting. 4 publications discuss building settings as one factor influencing the sense of home for PWD living in long-term care institutions. They include the location of the facility, building features, and supporting facilities. For residents, the care institution close to large stores and a park landscape are preferred (Van Hoof et al., 2015). Building features vary from located in large nursing homes to stand-along care facilities or bungalows, but all have small-scale living features. (Robinson et al., 2010; Verbeek et al., 2009). In the study by Van Hoof et al. (2015) and Lewinson et al. (2012), they stated that, in order to be counted as home, the residents should be able to access to supporting facilities (e.g., a shop, a hair salon, etc.).

Outdoors. Several studies provide examples of the vital role of the outdoor environment: a garden, or inner courtyards, are beautiful and healthy, providing a chance to contact natural environments, animals and plants. (A. Fleming et al., 2017; Van Hoof et al., 2016; Wada et al., 2020). The green views from the outside are also essential in developing a sense of home for residents (Van Hoof et al., 2015, 2016) and also beneficial in enhancing their well-being and good mood.

Technology. Within the category of technology, some studies see technology as a mean of keeping in touch with families and alerting practitioners to needs (R. Fleming et al., 2015; Verbeek et al., 2009). According to some findings from studies, easy access to TV and Wi-Fi contributed to the feeling of home, and it helps them get through the day and connect with the outside world (Van Hoof et al., 2015, 2016; Wada et al., 2020).

3.2. Intangible environmental features

As aforementioned, the tangible physical environment can influence the well-being of PWD and their capability to develop a sense of home. Further studies enlarge the point of view, including intangible environmental features as key elements involved in the process of developing a sense of home in people with dementia (Rijnaard et al., 2016). Intangible environmental features are optical, acoustic, tactile and other stimuli that stimulate the human sensory experience. It reflects the human sensory experience of the environment and objects. In the publications reviewed, the intangible environmental features that reflect the sense of home relate to cleanliness (Lewinson et al., 2012; Robinson et al., 2010; Wada et al., 2020), spaciousness (Van Hoof et al., 2016; Wada et al., 2020; Weeks et al., 2017), clear boundary (A. Fleming et al., 2017; Hauge & Kristin, 2008; Van Hoof et al., 2016), spatial accessibility (R. Fleming et al., 2015; Van Hoof et al., 2015, 2016) and light level (A. Fleming et al., 2017; Van Hoof et al., 2016; Wada et al., 2020; Weeks et al., 2017).

3.3. Holistic concept

Two studies included in our literature review present a holistic concept that explores how the relationship between people and space constructs the meaning of home for PWD. In Molony's (2010) study, the development of a home meaning in a care setting is a process of integration between the person and the environment, which encompass three stages: (a) Closing one door and opening another (closing the door to the past, determination to feel one's place somewhere), (b) creating a nest (building/investing in energy, places of personal power, sanctuary, relationships), (c) "My meaning" moving forward (self-reconciliation, continuity, projection of self in place, time). According to Vansteenwinke et al. (2012), the feeling of home is a dynamic balance between autonomy and security, (re)established by an ongoing process of appropriation. Spatial articulation, enclosure, sensory qualities, materials, form, measurements, and proportions were noticed to enhance the autonomy/security balance.

4. Discussion

This study performed a systematic review of the impact of built environment factors on the sense of home for PWD living in a long-term care institution. This review mainly focused on comparing 2 aspects: research categories and research findings. Scientific researchers adopt quantitative or mixed research methods, such as interviews, observations, literature reviews, and grounded theory, to collect data from various subjects. Studies from the design field are mainly based on research evidence from the scientific field and aim to optimise specific design strategies in practical projects. It has been proven that the five built environment factors, which are the private space and the (quasi-)public space, personal belongings, technology, the look and feel, and the outdoors and location, obtained from scientific research, can be applied as design principles by architects and interior designers in practice-led projects (Eijkelenboom et al., 2017). This research

approach is known as evidence-focused design (EBD), which intentionally optimises existing knowledge to aid design decisions and improve design outcomes. Thus, it provides insights that designers can use in specific design projects to achieve a better result (Frankel & Racine, 2010). Designers need to thoughtfully analyse the scientific information provided by current research and generate design decisions for practice projects. However, there is isolation between the scientific and design fields in this process. This type of (scientific) research is often not conducted by designers but by other scientific researchers, such as psychologists, gerontologists or cognitive scientists. It leads to a possible mismatch between the evidence generated by traditional scientific research and the knowledge needed in interior design practice (Moore & Geboy, 2010). This mismatch of knowledge comes from the differences in epistemology between the medical science and design fields. To be specific, scientific epistemology focuses on problems and causal relationship between things (Cross, 2001). So, scientific evidence tends to be atomistic, and it all works at a highly specific level (Lawson, 2013). It explains the reason why results of research-focused studies are mainly reflected in specific physical environments elements (Personal belongings, Domestic environment, Private space and Public space, Building setting, Outdoors, Technology) or features (cleanliness, spaciousness, safety, clear boundary, spatial accessibility and light level). In contrast to the science concerned with problems, designers use "solution-focused" strategies that are more concerned with obtaining the best solutions by synthesising (Cross, 2001). The design process is aimed at arriving at possible solutions by synthesising general design principles and then correlating specific features with the design principles previously detected. This can be described as an iterative process where specific features are constantly being designed to get the best solution in line with the design principles (Swann, 2002). Therefore, design tends to be integrative of different competencies, and so, good design work is the result of a holistic approach (Lawson, 2013). So, highly specific physical environment elements cannot, only by themselves, inspire designers to create a caring environment that influences people with dementia to have a sense of home. Especially for a meaningful space like the home, the mere accumulation of physical environment elements is not enough to constitute a home which requires a wider consideration of the interaction between people and the environment. Just like Molony (2010) and Vansteenwinke et al. (2012) explained, the environment-home relationship should be created according to a holistic concept of human-environment interaction. Through this systematic overview, we seek to uncover the problems that can be faced when translating environmental factors that provide a sense of home into design works and practice. Due to the difference in epistemology between the scientific and design fields, the contents of the knowledge supplied by the scientific field about the built environment factors that influence home feeling are not well used by designers in practice. Therefore, we propose standing on design epistemology, which focus on the human-environment interactive relationship that reflects the sense of home and then presents the best design solutions by synthesising physical factors in an iterative way, to gain new insights on relevant interior design features which may enhance the development of a sense of home for PWD living in care institutions. Research through Design (RtD) may be one of the approaches to achieve this goal. When we talk about RtD, we point out that design activities play a formative role in knowledge generation (Stappers & Giaccardi, 2005). Designers use their expertise to develop artefacts that solve problems repeatedly, and the prototype and design process plays a central role in the knowledge generation process. The prototypes here may be mistaken for "design works", but it is not the final design outcome but a tool to generate new knowledge.

5. Conclusion

This critical review presents a comprehensive understanding of existing publications about interior design features contributing to develop on the sense of home for residents with dementia living in a long-term care institution in terms of research categories and research findings. As aforementioned, the meaning of home is related to feelings of attachment – attachment to place, to space and attachment beyond the institution (Falk et al., 2013). In general, enhancing the development of a sense of home towards a care environment, becomes a crucial aspect in the process of increasing the well-being and quality of life of people with dementia. The results show that the existing homelike care environment design for PWD follows the evidence-based design approach. However, there are limitations in translating research evidence into design practice because of a mismatched knowledge foundation. Future research could consider design epistemology principles and related studies to understand the human-environment interactive relationship that reflects the feeling of home through spatial design (encompassing physical features as well as intangible ones), which will help to develop effective design strategies in practice. As aforementioned, creating a sense of home for people with dementia living in care institutions is more than an accumulation of physical objects and personal belongings. It is indeed needed to take into consideration also intangible features and to support the development of meaningful interactions and relationships between PWD and the surrounding carers, elderly and family members. In this direction, future research should focus on the development of more holistic guidelines in order to enhance the generation of good practices.

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