DESIGNING ENVIRONMENTS FOR PEOPLE WITH DEMENTIA

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DESIGNING ENVIRONMENTS FOR PEOPLE WITH DEMENTIA

A Systematic Literature Review

BY

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ABOUT THE AUTHORS

Alison Bowes is Professor in Sociology and Dean of the Faculty of Social Sciences in the University of Stirling, UK. Her research focuses on supporting older people to live the lives they want as they age, in a good environment and with care, if needed, provided in a person-centred, individually preferred way. She has a particular interest in supporting people living with dementia, including families and communities.

Alison Dawson has been a Research Fellow in the Faculty of Social Sciences, University of Stirling, UK, for more than a decade. As an Applied Sociologist, she draws on a unique blend of business-oriented academic qualifications and public and private sector regulatory work experience to identify, analyse and understand challenges to social policy and practice and offer workable solutions and recommendations for action. Her research has examined and evaluated a range of policies and practices aimed at supporting and/or improving the well-being of vulnerable older people in different contexts.

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BACKGROUND

There is now widespread recognition that the environment in which people live can be designed to support them to live better with dementia, and that poor environmental design can also be detrimental to living well. The research literature in this field is now very extensive, having grown rapidly in recent years. This paper updates an earlier review conducted by Fleming, Crookes, and Sum (2009) first published as part of the Dementia Services Development Centre (DSDC) at the University of Stirling's Design Audit Tool in 2009. Its aim is to provide the foundations for further development of practical design work in relation to environments which can enable people to live better with dementia. We have previously noted (Bowes, Dawson, Greasley-Adams, & McCabe, 2016) that much available advice on design has mixed provenance: whilst some design measures that are widely promoted have a strong evidence base, others have little. Rigorous review of evidence is therefore well-merited, and the present systematic review aims to contribute this.

Recent reviews which have addressed this area have some limitations. Our search and selection process (see below) identified four of these, which explored various aspects of designing environments for people with dementia. The present review is the most comprehensive, as it includes all types of research design and provides quality assessments of them. It also uses more comprehensive search terms.

Marquardt, Bueter, and Motzek (2014) review literature looking at the impact of the design of the built environment for people with dementia. They note that the evidence base is quite disparate. They both review and assess qualitative or quantitative research literature that measured the impact of the physical environment on people with dementia living in long-term care facilities, and in which people with dementia participated. They did not include other care settings (unlike the present review). Their review provided a hierarchy of evidence, whereby the highest level was met by experimental and/or controlled designs, with more qualitative work classified at a lower level, again in contrast to the present review which does not privilege any particular research design. They focus on a range of impacts or outcomes, falling into the categories of behaviour, cognition, function, well-being, social abilities, orientation and care outcomes. They summarise their findings according to four main categories – basic design decisions, environmental attributes, ambience and environmental information. They excluded studies which did not include precise design information. Following initial review, they included 169 studies. The review was able to demonstrate a range of positive impacts of environments for people with dementia across all the outcomes, except for cognition. They do highlight some limitations and evidence gaps: in particular, they privilege certain types of research design (the more controlled). They identify the control of daylight (for which there has not been consistency of support across studies) as a research gap and point out that some areas, such as sensory environments, are under-researched. Our study has also noted this.

Giving priority to certain research designs has historically limited the insights that may be drawn from literature. A Cochrane review (Price, Hermans, & Grimley Evans, 2001) of subjective barriers to prevent wandering for people with

dementia found no randomised controlled trials ('RCTs') or controlled trials that examined this issue and concluded that other experimental studies that were identified were unsatisfactory for a number of reasons. We would suggest that in a rapidly developing field, a range of study designs and even quite small studies may provide instructive insights as long as the limitations of the studies are acknowledged. One example could be Zeisel's (2000) review of environmental design effects on Alzheimer's disease (AD) symptoms in long-term care residents which 'recounts an investigative journey' and 'describes and links the work of a small group of investigators and practitioners'. This was not therefore a systematically undertaken review, but its conclusion that environmental design can improve both quality-of-life and health outcomes has been supported by other studies included in this review.

A previous review by Marquardt et al. (2011) is helpful for highlighting the need for a comprehensive and holistic overview of design. This sought to provide an overview of the available literature on architectural wayfinding design for people with dementia in caring environments. The authors concluded that floor plans could support spatial orientation and wayfinding, and that other interventions such as signage, lighting and colour cueing cannot fully compensate for 'unhelpful architectural design'. Similarly, Woodbridge et al. (2016) argue that the design of the physical environment is a particularly complex issue, and therefore difficult to research using more structured research designs. This review does not include quality assessment of literature and also limits itself to one set of outcomes however, namely support (or otherwise) for carrying out basic and instrumental activities of daily living (ADLs).

In the light of the gap in literature and the need for a comprehensive review taking a holistic perspective, relevant to a range of environments, which is open to alternative research

designs and tentative findings whilst retaining rigour and clear quality assessment, the aims of the present review were as follows:

- To systematically identify, examine and evaluate the literature on designing environments for people with dementia.
- To identify lessons for good practice that are grounded in research evidence.
- To inform future work on designing environments for people with dementia, including that of the University of Stirling.

METHODS

The review begins with a preparation phase which involves developing and testing search terms to achieve a balance between sensitivity (finding every relevant study but with the potential for huge numbers of irrelevant studies) versus specificity (higher ratio of relevant to non-relevant but with the potential to miss some). The process was informed by the design experience of DSDC which helped identify relevant terms. The quality assessment criteria were designed to ensure assessment of the full range of research methods used in the literature, and the research team developed initial criteria to guide the extraction of relevant information from the sources included. Light touch ethical review was carried out by the University of Stirling School of Applied Social Science Ethics Committee.

Identification of Relevant Literature

Table 1 lists the search terms used. These were aimed at covering the full range of terms for dementias and different types

Table 1. Search Terms Used.

Condition	Setting		Design Aspect	
Terms	**Term Group**	**Terms**	**Term Group**	**Terms**
Dementia* Alzheimer* Cognitiv* impair*	Building types	Home* Hous* Domestic Building* Hospital* Special Care Unit (SCU)* Day cent* Medical cent*	Whole building	Locat* Architect* Layout* Position* Structur*
	Key features of buildings	Entrance* Exit* Door* Wall* Ceiling* Floor* Step* or stair* Lift* or Elevator* Window* Corridor*	General support-related	Accessib* Usab* Suitab* Safe* Assistive Technolog*

Table 1. (*Continued*)

Condition	Setting		Design Aspect	
Terms	**Term Group**	**Terms**	**Term Group**	**Terms**
	Specific rooms/areas	Room* Hall* Dining Lounge* or living room* Bedroom* Bathroom* Toilet* Shower* En suite* Outdoor Balcon* Patio* Garden* Path* Examination room*	Senses-related	Sound* Noise* Visual Visib* Colour* or color* Contrast* Tone* Light* Reflect* Glare Pattern* Brightness Textur* Smell*

General	Environment* Refurbish*	Specific fixtures	Seat* Furni* Facilit* Fitting* Control*
		Addressing dementia-related deficits	Sign* Wayfinding Orient* Landmark* Appearance Recogni* Individuali* Familiar*
		Other	Cultur* Activit*

Notes: *Where possible single inclusive condition term used, i.e. (dementia* OR Alzheimer* OR (cognitive* impair*)). Not all databases allow for multiple bracketing of terms. Asterisk denotes 'wildcard' character, e.g. 'Architect*' returns items using terms including architect, architects, architectural, etc.*

Table 2. Databases Searched.

CINAHL
Medline
ProQuest (ASSIA + Social Services Abstracts + Sociological Abstracts databases)
PsychINFO
Web of Science – core collection
DAAI (Design and Applied Arts Index)
RIBA British Architectural Library Catalogue Online

of residential environments including types of buildings where people live and/or receive care, features of the buildings and aspects of particular rooms or areas, including any refurbishments and any generally focused discussions of design. Design aspects included the whole building, potential areas of support, matters relating to senses and sensory impairments, specific fixtures and fitting, dementia-related impairments and general areas of culture and activities. Table 2 lists the databases searched and Figure 1, the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) diagram, indicates the items identified and the process of arriving at the items eventually included. A PRISMA checklist for this review is available on request from the authors.

The majority of searches were carried out in December 2014–January 2015, with searches of Design and Applied Arts Index (DAAI) and Royal Institute of British Architects (RIBA) British Architectural Library Catalogue Online carried out in May 2015.[1] The earliest publication date was set

[1]Where later dates appear in the reference list, these refer to print publication, subsequent to online previews.