

The design of caring environments and the quality of life of older people

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ABSTRACT

There has been little systematic research into the design of care environments for older people. This article reviews empirical studies from both the architectural and the psychological literature. It outlines the instruments that are currently available for measuring both the environment and the quality of life of older people, and it summarises the evidence on the layout of buildings, the sensory environment and the privacy of residents. The conclusion is drawn that all evidence-based design must be a compromise or dynamic and, as demands on the caring environment change over time, this compromise must be re-visited in the form of post-occupancy evaluation.

KEY WORDS – environment, quality of life, care settings, older people, design.

Introduction

This article is concerned with the architectural design and physical environment provided by residential and nursing homes for older people, and the impact this has on the quality of life of the residents. To date, there has been little systematic research into such care settings, and this article reviews empirical studies from both architectural and psychological literature in order to investigate key issues in designing caring environments. It outlines the difficulties involved in measuring both the environment and the quality of life of residents, and it emphasises the importance of not only studying the design of buildings, but also the way they are used in practice. The terms ‘environment’ and ‘setting’ will be used interchangeably to relate to the care home building and immediate surrounding area that is available to the residents.

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In Great Britain, approximately five per cent of people over the age of 65 years live in residential care or nursing homes (Royal Commission on Long Term Care 1999). Although a minority of the older population, this group amounts to 350,000, of whom approximately 35,000 live in local authority residential homes, 163,000 in independent residential homes, and 150,400 in nursing homes (Age Concern 2000). The number of places available in British care homes is however falling because of reduced funding, and this has exacerbated the problems associated with discharging older patients from hospital. The dependency level of older people living in residential homes has been rising. A comparison of long-stay hospitals, residential homes and older people living in the community, carried out between 1979 and 1990, found that dependency had risen substantially, particularly in the private sector (Campbell-Stern *et al.* 1993).

Nursing homes have traditionally followed a medical model and emphasise the provision of skilled nursing care for residents with physical illness rather than cognitive impairment (Williams and Trubatch 1993). Both the research and the professional literature now acknowledge the influence that architecture and design can have on both the well-being of the residents and the quality of care by staff in residential and nursing home settings (Keen 1989; Netten 1993). While their design has rightly emphasised the requirements of the physically frail, it is also recognised that people with cognitive impairment and dementia also have specifiable environmental needs. The architecture and design of care homes for older people must have some influence over the quality of life and care received, but the historical and persistent use of medical models for this type of long-term care clashes with efforts to satisfy the non-medical needs of frail older people (Schwarz 1997). The pattern of provision in the British care home sector is currently changing. Many of the older homes, both purpose-built and conversions of large private houses, fail to meet the space requirements of the *National Minimum Standards*, and need extensive refurbishment if they are to continue in use (Department of Health 2001). Ever-larger units are being built to supply different levels of provision within a single building. The former diversity of buildings is tending to narrow, and the basis for evaluating the contribution of different environmental features to quality of life is gradually being lost (Barnes *et al.* 2001).

Measuring the environment

To date, there has been a shortage of appropriate, comprehensive and objective instruments for assessing the outcomes of building design. This assessment can also be referred to as a post-occupancy evaluation, when a building is revisited in order to establish how it is working in practice. Strategies for assessing nursing or residential home environments tend to be structured using either discrete or global conceptualisations. Discrete or micro-conceptualisations treat the environment as a set of independent variables and typically focus on one or only a few characteristics. On the other hand, global or macro-conceptualisations view the care setting as a single entity, and examine the impact of the whole setting on individuals. There is a shift towards the global or holistic approach which, rather than focusing on discrete behaviours and particular environmental solutions, recognises the more complex set of relationships found in the care setting (Calkins 2001).

One of the earliest environment assessment instruments is the *Multiphasic Environmental Assessment Procedure (MEAP)* (Moos and Lemke 1996), which was specifically designed to assess both nursing and residential care homes. It includes five separate scales: policy and programme information, resident and staff information, the physical and architectural features, social climate, and a generalised rating scale. The physical and architectural features scale incorporates the domains of community accessibility, physical amenities, social and recreational aids, space availability, safety features, staff facilities, orientational aids and prosthetic aids. The *MEAP* is however a very detailed assessment (except that it lacks detail in the domain of the sensory environment), and the scoring is biased towards larger, more insitutional care settings, which makes it difficult to use in multi-site studies.

Another such tool, with specific reference to dementia care settings, is the *Professional Environmental Assessment Protocol (PEAP)* (Lawton *et al.* 2000). This scale is based on indicators of the attributes of place experience, and it evaluates the extent to which a setting meets each goal. This measure includes eight domains, namely the features that: promote safety and security; promote awareness and orientation; support functional abilities; facilitate social contact; provide privacy; create opportunities for personal control; regulate and promote high quality stimulation; and encourage continuity of the self or individual identity. The team that developed this tool concluded that the minimum environmental assessment should include items evaluating residents' awareness and orientation, environmental stimulation and challenge, safety and security, privacy and control, healthy and

familiar environment, and general comfort (Teresi *et al.* 2000). It should be noted that the *PEAP* requires administration by an expert in environmental design.

Other environment assessment instruments have been devised for the specific purpose of assessing Special Care Units, which are designed for people with dementia and were established in the United States and Canada during the early 1990s. They are separate units of approximately 20 beds with specially trained staff and programmes that are housed in a much larger nursing home (Grant and Sommers 1998). Assessment instruments for these settings include the *Therapeutic Environment Screening Scale* (TESS) (Sloane *et al.* 2002), which has 84 discrete items and one global scale covering 13 conceptual domains. This descriptive instrument was originally developed to differentiate between the environments of Special Care Units and traditional nursing homes. The *Environment-Behaviour (E-B)* model (Zeisel *et al.* 1994) includes both descriptive and evaluative assessments of Special Care Units, and it combines aspects of both global and discrete perspectives. Like the *MEAP*, both of these assessment instruments are based on United States care settings which tend to be much larger than the British equivalents.

Measuring the quality of life

Defining quality of life for older people is highly problematic. There is a tension between the need for objective standards and an imperative to take into account the subjective nature of the quality of life. Therefore, any definition and attempt at measurement should include both objective and subjective indicators and should include all facets, not only the good things in a person's life, but also the bad things (Farquhar 1995). A consensus has developed in the conceptualisation of quality of life as a multidimensional construct, containing domains of physical health, psychological wellbeing, social relationships and the physical environment (World Health Organisation Quality of Life (WHOQoL) Group 1998).

In the past, there has been a problem of measuring this complex construct, particularly in the residential care population where levels of cognitive impairment are high. Nevertheless, some progress has been made in assessment, utilising instruments that elicit a subjective evaluation of quality of life amongst this population. The *Subjective Evaluation of Individual Quality of Life (SEIQoL)* procedure determines which domains of the quality of life are meaningful to the individual

(Coen *et al.* 1993). It uses a structured interview technique followed by manipulation of a moveable 'pie chart' to demonstrate the importance of each of the domains. Other research has suggested that the observable behaviours of people with dementia can offer insights into their internal states, leading to more emphasis being placed on understanding their subjective world (Lawton 2001; Russell 1996; Kitwood and Bredin 1992). Kitwood and Bredin (1992) describe an observational method for evaluating the process of dementia care, known as *Dementia Care Mapping (DCM)*. They have developed this into an important research tool, the 'DCM Method' (1992), which enables a detailed and structured appraisal of the care given to people with dementia in 'formal' settings. DCM gives priority to the capabilities and needs of each individual. A further method of measurement is proxy assessment carried out by a close relative or key worker of the individual concerned (Albert *et al.* 1996). Quality of life in dementing illness comprises the same areas as in people in general, and the most successful way of assessing this is by using a combination of quality of life indicators (Lawton 1994). A comprehensive review of measures of the quality of life in older people is beyond the scope of this review (readers can refer to Bowling 1997).

Existing evidence for design in caring environments

There is an overall shortage of empirical evidence on the physical environment in care settings, for most studies have been small scale or anecdotal. This should be borne in mind when considering the design guidelines presented below. The main areas which have been investigated involve the general layout of the building, the sensory environment within the building, and the privacy and autonomy of the residents. These are discussed in more detail below.

Layout, wayfinding and special environments

Disorientation in residents, caused by dementia and the immediate effect of institutionalisation, is an increasing problem for the architects who design residential and nursing homes. There is little information on ways of designing buildings which are reassuring and comprehensible to a person suffering from dementia, but the emphasis should be on small, local and domestic settings (Marshall 1992). In terms of the size of residential homes, overall satisfaction with the scale of residential life is depressed when home size exceeds 50 beds, which

leads to more complex designs and fewer opportunities to talk to staff (Kellaheer 1986). The group-living design was initially thought to offer a more homelike environment, with residents living in small independent groups of about 10, with separate facilities. The configuration has no equivalent in non-institutional society, being neither wholly medical, nor institutional nor domestic, though all these are present in some degree (Kellaheer 1986).

Wayfinding refers to the problem-solving abilities necessary to reach destinations. Nursing and residential homes which facilitate spatial orientation and wayfinding can contribute to a person's quality of life but there are few empirical studies (Passini *et al.* 2000). One study examined the effect of design on the ability of residents with dementia to find their way around in a few residential homes. Using a newly-devised, unauthenticated measure of wayfinding, it was concluded that homes where the residents lived in groups provided a more favourable design, and that the level of lighting was important in finding their way around. Residents living in care homes which had been adapted from older premises were more able to find their way around than those in new premises. 'Meaningful decision points', such as notable architectural features, facilitate a resident's wayfinding ability in both types of home (Netten 1989). Passini *et al.* (1998) explored wayfinding abilities in people with Alzheimer's disease. They carried out a qualitative study using a small sample of patients with a dementia diagnosis and a control group. Their results showed that most participants were incapable of developing an overall plan to solve the wayfinding task, or of making decisions involving memory or inference. They were, however, more able to make decisions in buildings with well-articulated entrances, staircases and landmarks. Kidd (1996) points out that observing people move around in buildings is a useful method of assessing wayfinding skills. He suggests some design criteria which translate into two major approaches, the 'introverted' and the 'extroverted plan form'. The introverted plan has the main activities area in the centre of the building and there is restricted access to the outside: the key design feature is total visual access. The extroverted plan is based on a conventional house plan, enclosed by acceptable fencing: the key feature is the familiarity of the house design.

'Reality orientation' is a technique that started in 1950s America and provides a framework in which staff are encouraged to see residents as people rather than a collection of tasks (Kitwood 1997). It is specifically designed for residents who are confused and involves structuring the care setting with signs and cues to help the resident to remain aware of their surroundings. The technique, however, lacks a sound knowledge

base and is difficult to evaluate (Holden and Woods 1982). Some studies have found that residents find the reality-orientation cues patronising and child-like (Voelkel 1978; MacDonald and Settin 1978).

The United States 'Special Care Units' are well-adapted living environments, which not only meet the basic requirements for lighting, heating and acoustics, but also support the special behavioural needs of people with dementia in the more advanced stages (Grant and Sommers 1998). Various research projects have been carried out in the Special Care Units, and they recommend that for residents to have maximum autonomy, independence and privacy, the units should be small and have specially-trained staff. Residents with mild or moderate dementia should be housed in ground floor facilities with easy access to outdoor spaces, which provide paths for wandering as well as visual and other sensory stimulation (Williams and Trubatch 1993; Swane 1992).

Manser (1989) has also addressed the needs of people with dementia from an architectural perspective, reasoning that they retain the capacity to respond to shape, size and light and also an instinct for privacy and modesty. He stresses the importance, when designing for this population, of maintaining simple ideas, including symmetry, balance and the avoidance of corridors. He suggests that a well-designed, well-proportioned building with generous windows and high levels of daylight will not only improve the quality of life of the residents, but also improve the morale of their carers and therefore the quality of their care. If staff have more adequate physical facilities, it has been found that they are more likely to establish clear policies and provide residents with more choice in their daily activities (Moos and Schaefer 1987). More detailed aspects of designing for people with dementia include the sensory environment, interior design and the role and function of appropriate seating (Brawley 1997; Peachment 1996).

Sensory environments

Sensory stimulation is concerned with the different elements of sight, smell, hearing and touch. Attention to these qualities is an important aspect of the caring environment, as the confusion suffered by people with dementia is caused in part by reduced sensory receipts through the reticular activating system of the brain (Marieb 1995). Multi-sensory environments provide sensory stimulation and often involve special rooms, referred to as 'snoezelens', which have been created to present various sensory stimulants. They may have positive benefits, such as

inducing greater happiness and calmness and a reduction in sadness and fear (Moffat *et al.* 1993). Studies of these sensory rooms or snoezelens warn that improvements in the users' quality of life may result from increased staffing rather than the environment itself (Woodrow 1998).

A garden is an important part of the care setting and can provide diverse sensory stimulation, including sound, colour and fragrance. Outside spaces are often added to care homes as decorative features but without thought being given to their therapeutic benefits. Well-conceived external environments can provide older people with spaces for privacy, activity and stimulation, all of which can contribute to an improved quality of life (Brawley 2001). Enriching the care home environment is thought to enhance the well-being of its residents. Using visual, auditory and olfactory stimuli, Cohen-Mansfield and Werner (1998) attempted to simulate two care environments, the home and the outdoors. They found that residents appeared to prefer the enhanced environments which provide a low-cost method of improving the surroundings, although the effect was not large, the sample was small and the period of intervention short.

A substantial amount of research points to the significance of both artificial and natural light on various behaviours in the nursing and residential home environment although with inconsistent emphases and results (Okumoto *et al.* 1998; Kolanowski 1990). There are positive and negative aspects of sunlight in indoor space. The negative factors include glare and overheating, while positive factors include using it as a source of heating, or to enhance the visual and emotional wellbeing of the occupants. In environments where the well-being of the occupant is an important concern to the designer, this intrusion of sunlight ought to be controlled (Boubekri *et al.* 1991). In an experimental study of improved lighting in a reading area, follow-up interviews over three years indicated a relationship between the lighting and an improved quality of life of older people (Sorensen and Brunnstron 1995). The participants did not want to return to the previous poor lighting conditions.

Privacy, space and autonomy

Research findings suggest that privacy is a most important aspect of the environment of older people (Morgan and Stewart 1998; Duffy *et al.* 1996). Keen (1989) describes three dimensions of privacy in relation to the physical environment: visual, acoustic and olfactory. Netten (1993), on the other hand, describes privacy in terms of the social

environment, and defines it as the need to be separate from others or the degree to which one is separate from the community. Personal space is the area immediately surrounding an individual, and if the individual has control over that space it becomes claimed territory or 'defensible space'. Space which is not defensible undermines the sense of ownership residents may attach to their rooms, while restrictions on the use of the space or frequent uninvited intrusions by staff can undermine a sense of ownership of the personal territory. A study of one Special Care Unit suggests that personal variables, such as cognitive impairment, affect and perceptual changes associated with dementia, could interact with environmental variables, such as density and privacy, and negatively influence the behaviour of the resident (Morgan and Stewart 1998). Duffy *et al.*'s (1986) action research project on two nursing homes found that, although both administrators and designers favoured designs that promoted social interaction, nursing home residents consistently selected designs that enhanced privacy. This clearly highlights the need for users to be involved in the design process. The authors suggest that if better privacy options were included in the design of care homes, social interaction may be more welcome.

The boundary which distinguishes home from the outside world is one of the physical markers of privacy, but within this boundary other markers operate which reinforce and allow more subtle gradations of privacy. A more 'homelike' gradation of space may provide small private places for receiving visitors other than the resident's own bedroom, for example a conservatory or small, quiet lounge. Residents should have the opportunity to choose from several spaces where they may want to spend time, and this opportunity for choice may help to reduce the sense of intrusion into personal space (Brawley 1997). A small qualitative study carried out by Morgan and Stewart (1999) found that relatives and staff felt that many residents enjoyed having their own private space. However, they believed that the unit should also have several semi-private rooms so that residents who were positive about having a room-mate would also have the option of privacy; for double rooms provide few opportunities for controlling social interaction. The authors suggest that an ideal environment would provide opportunities for both privacy and interaction.

Within the privacy of their own home, a person can control and conceal their declining capacities in the management of daily living. On the other hand, a care home is arranged physically and organisationally to be a communal arena, so the control and concealment of frailty permitted at home are no longer possible. Frailty

can be revealed and exposed and personal power diminished (Willcocks *et al.* 1987). The determinants of enhanced or maintained quality of life may broadly be summed up as those factors which permit residents to control and organise their lives in care (Kellaher 1986). Evidence suggests that residents are more satisfied with and express definite preferences for those care arrangements which offer a fundamental rather than token measure of control over their freedom of choice. An inability to control the residential environment, for whatever reason, appears to be associated with reduced satisfaction. This can include having no control of heating and ventilation in the resident's bedroom. When bedrooms are defensible and private, residents are more likely to personalise their rooms, which indicates that they feel a greater sense of territory. This sense of ownership, privacy and control over the environment enhances the quality of life (Willcocks *et al.* 1987).

The balance between autonomy and security characterises the search for an ideal architectural setting able to keep both support and stimulation in equal focus (Parmalee and Lawton 1990). The physical attributes of the architectural framework are not important in themselves, only in that they can provide a degree of autonomy and individual choice for residents. Ideally, plans should take into account residents' characteristics, staff attributes, intended programme and the physical features of the environment, all of which are important (Schwarz and Brent 1999; Cohen-Mansfield *et al.* 1995).

Priorities for future research and design

Research to date has provided only a broad understanding of the complexities of care settings and their influence on both residents and staff. For example, the majority of evidence falls into the categories of overall building layout, the sensory environment and the provision of semi-private spaces. Most of the evidence is anecdotal and does not substantiate statements about 'best buildings', and most refers primarily to traditional residential and nursing home settings. While these currently provide the majority of care homes in Britain, they may have a limited capacity to respond to the changing needs of residents. A new generation of buildings is emerging in response to the aim of enabling people to live independently, in the form of more flexible, supportive housing schemes. These schemes offer various levels of support, with the intention of providing flexible care that can increase with the older person's needs (Peace and Holland 2001). There is a need, however, to evaluate the extent to which these schemes genuinely

facilitate flexible care. Empirical studies are needed in order to gather the views of all parties concerned, including residents, visitors, staff and care home managers (Abbey and Schneider 1999).

While appropriate comprehensive and objective instruments for assessing the design of care home buildings remain underdeveloped, some progress has been made. However, most of the instruments have been developed in north America where the emphasis is on much larger care homes containing separate Special Care Units for residents with dementia. There is still a need for validated and reliable instruments, more relevant to British care settings, which can be used to assess buildings both 'as designed' and 'in use'. A framework is also needed for articulating the difference between person-centred issues like privacy, autonomy and choice, and the physical needs of the residents. Many different indicators of quality of life have been developed, and research indicates that using a combination of these, for example, proxy questionnaires, observations and interviews, may prove the most successful in assessing the quality of life of older people in residential care settings (McKee *et al.* 1998).

The ways in which a building meets the needs of the residents is of importance not only when it is being designed, it should also be regularly reviewed after it is occupied in the form of a 'post-occupancy evaluation'. Buildings are expensive and last a long time and it can be difficult, if not impossible, to retrofit a care home in order to meet new minimum standards, particularly when there are dimensional constraints. This can result in users having to compromise or, in extreme cases, buildings being demolished or changing in function because they are unable to be adapted to meet minimum standards. This cost of building renewal can mean a reduction in resources available for care.

A close liaison between health care professionals and designers, alongside input from evidence-based research, could help to influence the quality of the buildings being designed. There is a need for dialogue among all concerned, for a multi-disciplinary approach to design, and for more emphasis on post-occupancy evaluation, with quality of life as one of the criteria of the success of the design. It seems that, as yet, 'researchers are uncomfortable with designers' inability to predict the performance of their buildings in relation to human activity' (Schwarz and Brent 1999: xxv).

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