

Building Edge

An Ecological Approach to Research and Design of Environments for People With Dementia

BY GARUTH ELIOT CHALFONT, BM, MA, ASLA, AND SUSAN RODIEK, PhD, NCARB

Designers and care practitioners are often frustrated by the underuse of outdoor areas by residents of dementia care facilities, in spite of the clear intention to design outdoor spaces that meet residents' needs. Even though many residents express enjoyment from contact with nature, and interdisciplinary research evidence strongly supports such interaction, investment in outdoor resources is often a gamble. Evidence-based design is the accepted norm, although gathering evidence and applying it to design requires creative strategies. This article suggests taking an ecological approach to research and design by engaging people, plants, and place in ways that stimulate curiosity and provide opportunities for normal life. Case studies illustrate how listening to the residents directly, and research by immersion rather than intervention, affords integrated design solutions that are embedded in day-to-day life. Suggestions are given for place making at the building's edge, to encourage enjoyment and human relationships, through which the use of outdoor environments by people with dementia and care staff is a happy consequence instead of a primary aim.

Key words: dementia, design, environment

DESIGNING FOR NATURE AND OUTDOOR ACTIVITIES

Designers and care practitioners generally agree that nature and the outdoors could potentially contribute

significantly to quality of life for residents in long-term and dementia care environments. Benefits such as better sleep patterns, improved hormone balance, and decreased agitation and aggressive behavior¹⁻⁵ have all been observed in

Alzheimer's Care Quarterly 2005; 6(4):341-348
©2005 Lippincott Williams & Wilkins, Inc.

association with contact with nature and the outdoors. For these and other reasons, the emphasis in facilities so far is often toward either the built environment as stimulus, or activities as interventions. Although it is known that staff assistance and programmed activities are effective in getting people with dementia outdoors, the physical environment itself can also be a positive force, and, after being built, requires minimal ongoing expense to exert a continuous and potentially encouraging influence on residents.

People with dementia are uniquely challenged in their use of the outdoors. Nevertheless, they also share many outdoor needs and basic preferences with other older adults. The following list suggests some of the main factors that may influence the quality of outdoor experience in aging:

1. **Comfort**, in elements such as shade, temperature, and comfortable seating.
2. **Security**, in terms of the space having an appropriate scale and level of enclosure.
3. **Visual appeal**, such as pleasant greenery, flowers, views, etc.
4. **Visual contact**, so residents do not feel isolated from the facility indoor areas.
5. **Easy access**, allowing residents to go outdoors without major effort.
6. **Safety** of elements, such as smooth, level paving, and absence of physical hazards.
7. **Accessibility** of elements, such as easy-to-open doors etc.
8. **Sensory** qualities, such as absence of paving glare, and presence of appealing textures.
9. **Activity** potential, such as paths for walking, or a fishpond to watch.
10. **Transition** zones that soften the disconnection between indoors and outdoors.

UNDERUSE OF OUTDOOR RESOURCES—A MATTER OF ELEMENTS OR BALANCE?

It is commonly observed that outdoor areas in residential facilities for ageing and dementia care are often not used as much as they could be.⁶⁻⁸ This is in spite of the physical mobility of many residents, and the enjoyment they apparently derive from spending time outdoors and from having contact with natural elements.^{9,10} For the past several years, conscientious facilities have made serious efforts to construct successful outdoor spaces for dementia care, often based on research findings on elements such as the factors listed above.

Facilities that lack certain of these elements may suffer from underuse of outdoor areas, but judging from widespread reports of underusage, design elements alone do not appear to guarantee success, particularly because the ability to initiate independent action diminishes. Whereas the building is obviously important, the staff and management are crucial to its success. Good staff can help create quality of life in a difficult building. Likewise, the building can help them do the job better. For instance, one issue may be a perceived “lack of initiative” on the part of the resident, in which case staff, relatives, and the physical environment are all implicated. But what do we mean by “initiative” and how exactly can a stimulating environment help a particular resident? If all the design criteria are met, and the people on staff are wonderful, we still may see very little nature-related activity. Is it the right elements, the right balance, or something else altogether?

PLACE AS A STUDY OF PROCESS

Controlled studies and postoccupancy evaluations give insight into *what* aspects of the space may or may not be working as the stakeholders had hoped. But such studies do not strongly impact design because they may fail to uncover *how* and *why* people use spaces the way they do. We would argue that to understand the how and why of using space, one must (1) spend time in it and (2) understand “environment” as a process, rather than a place. While standing outside a care home recently wondering where we might build a greenhouse, I noticed a piece of bread and jam on the ground. The next morning it was a handful of rice crispies. Looking up, I realized it had come from a resident’s window. Stepping back out of the way and watching for a moment I saw the sparrows return to their breakfast.

That lady who lives upstairs is place-making every day at the building’s edge. There are more birds in the garden because of her. Daily life is the action of making a place, and the edge is where most of the action occurs. Any place we investigate is merely a snapshot of a process. But by looking closely at interactions, we can better understand the energy and dynamics that drive the process of place-making and, in so doing, make better places. Think of a beach. Every day it is different. A beach is an edge between water and land, but it is also a process affected by wave dynamics, sand size, sea level, and the moon. Attempts to combat beach erosion with concrete battlements often result in disastrous effects, but wise land use and revegetation actually build the coastline. As the coast builds, life emerges—sandpipers, fiddler crabs, sand castles, surfboards, and corn dogs.

ACTIVITIES AND ARCHITECTURE—INDOORS, OUTDOORS, OR THE LIVELY EDGE?

The concept of the “building edge” as being a lively place was well developed 30 years ago by Alexander et al in the book *A Pattern Language*, which states,

When it is properly made, such an edge is a realm between realms: it increases the connection between inside and outside, encourages the formation of groups which cross the boundary, encourages movement which starts on one side and ends on the other, and allows activity to be either on, or in the boundary itself.^{11(p755)}

Their main idea was that buildings are generally thought of as turning inward, but must be rethought as also “oriented toward the outside.”^{11(p753)} Within the social fabric of a town or city we can easily see how this occurs—why are sidewalk cafes so popular? Edges occur naturally in nature—where the forest meets the field or the ocean meets the landform. These areas are richly diverse ecologically. Edges generate life by the meeting of 2 different things—a marriage of sorts, for better or worse. The entity created is different from either one by itself.

The building edge was fully explored in the brilliant little book by Danish architect Jan Gehl entitled *Life Between Buildings: Using Public Space*,¹² describing how buildings generate activity in public areas. He identified 3 types of activities: necessary, optional, and social. Necessary activities are compulsory and take place independent of the exterior environment, such as going to work and shopping. Optional activities, “those pursuits that are participated in if there is a wish to do so and if time and place make it possible,”^{12(p11)} include activities such as taking a walk. Social activities are “all activities that depend on the presence of others in public spaces”^{12(pp11–14)} and include both passive and active contacts with other people. A social activity

takes place every time two people are together in the same place. To see and hear each other, to meet, is in itself a form of contact, a social activity.... This connection is important in relation to physical planning. Although the physical framework does not have a direct influence on the quality, content, and intensity of social contacts, architects and planners can affect the possibilities for meeting, seeing and hearing people—possibilities that both take on a quality of their own and become important as background and starting point for other forms of contact.^{12(p15)}

In a study of street activity in Ontario, Canada, in 1977, Gehl identified that “coming and going activities” com-

prised only 10% of activities, while stationary activities accounted for 90%. Reasons for this included “something to do or work with” and “good staying areas” directly in front of the houses. No wonder he found activity outside multi-story buildings so limited—“the additional activities that could take place never have a chance to develop.”^{12(p187)}

How might this relate to a care setting, and particularly one for people with dementia? “Building edge” is not just a place, it is a verb, something we must purposefully set out to do. Therefore, how can Alexander’s vision, “connected to the world around it by the simple fact that it is made into a positive place where people can enjoy themselves,”^{11(p754)} be realized? In an attempt to move forward this idea of “building edge” as something that designers must take responsibility for, some recent case study research is presented that illustrates a way of integrating research and design through immersion in the daily life of the care home environment.

CASE STUDY FROM RESIDENTIAL CARE IN YORKSHIRE, ENGLAND

The following comparative case study investigated the importance of nature to people with dementia by gathering data through observation, discourse, and built environment surveys of the architecture and landscape of 2 care homes in the north of England. Analysis of human-environment interactions broke down the researcher’s preconceptions about residents’ needs and the ability of the environment to meet them. How might living on a locked upper-floor dementia wing affect one’s connection to the outdoors when compared to a ground-floor wing in another home? The upper floor had various views from 3 common rooms. Residents expressed strong affection toward view content, including some spatially descriptive memories of the local vicinity. The home had a large outdoor area (designed with many garden features and a greenhouse), which upper-floor residents rarely used. As an experiment, residents were taken downstairs and were audiotaped and photographed spending time in the garden. Although they did not remember it afterwards and continued not to know the garden existed, their response to the garden and being outdoors was overwhelmingly positive and clearly lifted their spirits. More people turned down the offer to go to visit the garden than accepted it, perhaps because they could not see where they were being invited to go. Although physical disability (more than having dementia) seemed to limit access, it was hypothesized that residents living on a ground floor might benefit from regular access to outdoors.

This was investigated in a second care home on the ground-floor wing with an accessible, interesting, well-furnished, and maintained patio. Since the patio was not visible from the lounge, most people when asked did not know it existed, even though some residents use it regularly by going outside with staff or family. The doorway to the patio is always unlocked and visible from the main corridor, but there is no indoor seating from which the patio can be viewed by residents. Audiotaped conversations and photographs taken of the participants on the patio revealed a range of built features which contributed to their enjoyment in being outdoors, including (1) being seated in a warm microclimate, (2) having a view of grass, trees, and birds, and (3) comfortable seating for 2 to converse. Overall, the study found that factors contributing to connection to nature included

- the person's attitudes and beliefs,
- their proximity and access to outdoor areas,
- their physical comfort, and
- routine use of outdoor areas.¹³

Further conversations in both homes revealed an area particularly rich for development of theory and design—the idea of not *use* but *peruse* (“to examine or consider with attention and in detail”) or, as they say here in Yorkshire, to “nosey.”

Pleasant in't it...lovely, like grass and trees and what not. I love it. (laughs) Lovely wall there. Lovely view in't it?... Well you couldn't wish for anything better. Could you?

[That's important to you is it?]

Well, to be able to look out and nosey, (laughs) out of the window.

[And “nosey”? What does that mean?]

Well...you know, you're looking round...houses...

[Looking round, at what?]

Don't know, anything that's going. (lady resident)

THE GREENHOUSE—AN EXAMPLE OF “BUILDING EDGE”

This is a generation that saved long and worked hard for their homes, took pride in place and cared for what they valued. A neat, tidy place reminds people they too are valued. Just because a lady is wearing “canteen medals” on her blouse does not mean she does not notice if something is dirty or out of place. Most residents at both homes were

observed to have particularly acute powers of observation. Therefore, a greenhouse project was undertaken at the second home—designed and sited to encourage both using and perusing (by staff and residents of all floors and the day center). The greenhouse was situated at a location visible from the patio and the indoor “family kitchen” (an earlier successful project to enhance family visits). Because it affords seeing-into-ness without commitment to do anything, is a talking point in the family kitchen, is visible from the internal corridor and the day center, and is visible to residents living on other floors in the home, it proved a success even before construction was completed because it had already entered consciousness. Residents in the dining room knew it existed, even without a view of it. Specific design features included a custom-made dementia-friendly, level doorway, eliminating the customary greenhouse door-frame and the need for a ramp up to it. This not only made it accessible for older people in general, but for people with dementia, for whom even the perception of a step can be a psychological barrier to use. So the paving was selected, cut, and installed to diminish the sensation and therefore the perception of entry. The fencing was reconfigured to open up the view, secure the area, and integrate the space.

The location and orientation of the greenhouse also had created a warm, sunny, quiet seating spot at the front door—for perusers of users! Such secondary uses of outdoor environments are particularly relevant given the pleasures people with dementia ascribe to “noseying.” One key to outdoor use just may be having reasons to go out that take the focus off one's self. This research resulted in a design evolution at the home (Fig 1) that did not involve altering the building at all—only the use of the building's edge by some additions to the adjacent outdoor areas. While it is possible to identify design criteria contributing to this synergy of people, plants, and place (see Box), every resident, culture, and home is unique. Design criteria must not become a shopping list but a starting point with which to provide opportunities for staff, relatives, and residents to engage in normal activities. The “Three Steps” are added below to stimulate your thoughts in this direction. How might residents, families, and staff enliven the sense of place by increasing everyone's involvement with nature?

THREE STEPS TO INCREASE THE PRESENCE OF NATURE IN THE LIVES OF PEOPLE WITH DEMENTIA

Step 1—Remind and reawaken a need

Rather than “meet residents' needs” we might need to recreate them, because people with dementia forget they

Seating provides a choice of views from sun or shade with enclosure or openness.

Brick retaining wall topped with wrought ironwork and entwined with flowering vines affords views out through leafy foliage.

Paving seamlessly connects original patio area with newer greenhouse area, creating the sense of a welcoming flow between spaces.

View from greenhouse vent-window is uphill to grass, trees, and sky.

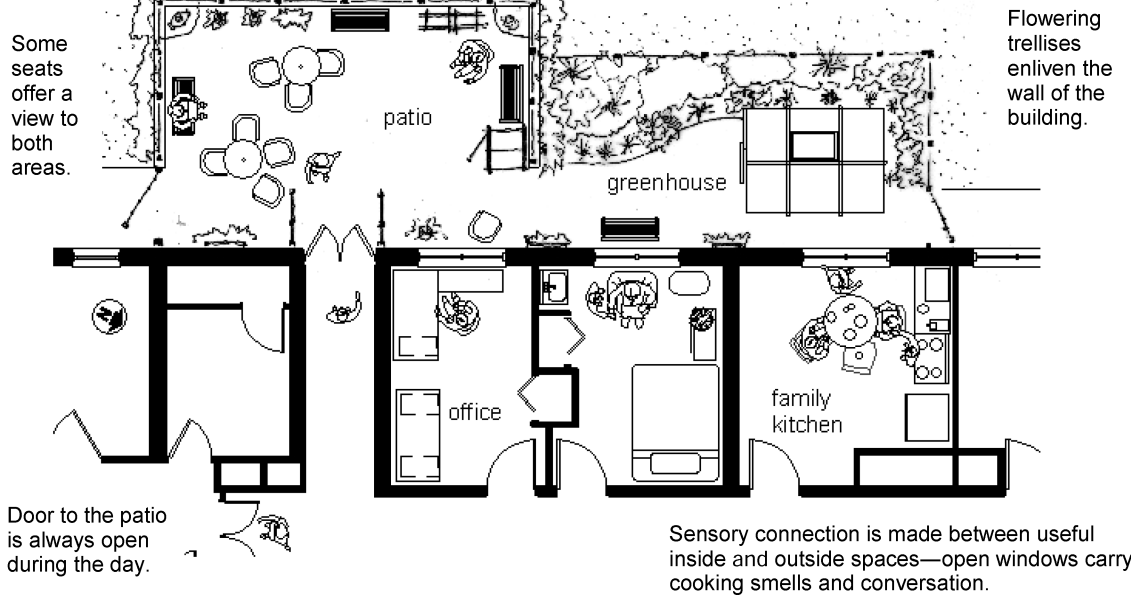


Figure 1. “Lively up your edge”—Integrating resident, staff, and family life with nature and the building in an English residential home offering dementia care.

have needs. One gentleman shows me the scars on his knees every time I visit as if it happened since I last saw him. A design must remind us what nature has to offer, entice us, and instill a daily desire to reexperience it. In the film “50 First Dates,” Adam Sandler has to make his girlfriend, Drew Barrymore, fall in love with him every day because she has amnesia and wakes up like a blank slate and does not know who he is. Eventually, they marry and have children, and every morning she wakes up and watches a video (this was the car crash, this is your husband, these are your children, etc) that reminds her of her life. With nature and dementia, we can draw on long-term memory—gathering blackberries, father and his greenhouse tomatoes, digging potatoes, and so on. A 5-minute chat about a garden memory and a walk in the park are both pleasurable, and are to be encouraged! But a walk in the park may be forgotten 20 minutes later, whereas feeding Grandma’s chickens is a memory that will never leave us

and may therefore help reawaken a *need* for nature. Memories are invisible resources.

Action point: Grow nature prolifically—around the windows, on the ground plane, near and at a distance. Fill our day with constant green reminders of things we used to love.

Step 2—Nature, sensation, and emotion: The joy of place

Nature is a large powerhouse of sensation to step out into—scents, breeze, sounds, movement, color, texture, patterns of sunlight, and living things returning in everlasting cycles. To watch a massive oak tree on a grassy slope tossing in the golden autumn sunshine against a cobalt sky full of white fluffy clouds... may sound poetic but it touches archetypal knowledge of running and playing beneath it. This is the spiritual, sensual connection nature uniquely allows.

**How to lay the “groundwork” for successful dementia care environments:
Design criteria for synergy of people, plants, and place**

1. Create normal spaces and invite families to enjoy them with their relatives, diffusing risk and alleviating health and safety concerns. Spaces must
 - a. Take the focus off the resident
 - b. Give children a place to create

Examples: family kitchen, greenhouse, allotment, victory garden
2. Connect spaces physically and visually
 - a. Allow movement to flow between spaces through easy access
 - b. Transitional spaces are places too—a bench inside or outside the door
 - c. Design “triangles” of interest with 2 potentially interesting things within view of the person and within walking range of the least-abled

Examples: greenhouse outside the family kitchen window, and allotment or vegetable patch outside the dining room window—both being connected physically and visually to the patio
3. Connect spaces through timing and routines
 - a. Serve regular meals, teas, or drinks to residents outdoors in good weather
 - b. Have gardeners/landscapers work when residents can be watching
 - c. Coordinate day center residents’ use of the greenhouse or patio when residents of the dementia care wing are able to enjoy some interaction
4. Design for the pleasure of “noseying” by developing “edge spaces”
 - a. Places to sit or stand while looking to the outdoors or to the indoors

Examples: bay windows, window seats, porches, sheltered entryways

 - b. Partial obscurity feeds curiosity, and encourages taking a closer look

Examples: greenhouse with poly glazing rather than glass; lace curtains
5. Share outdoor resources
 - a. Install play equipment for grandchildren; invite the local daycare in
 - b. Make a horseshoe pitch or bowling green for relatives and locals to use
 - c. Give community gardeners a plot to dig (then sell them hot dinners!)

When was the last time you felt the freedom of gently rocking on a swing and looking up into the sparkling leaves with the breeze in your hair? You will reexperience the joy of place if the environment stimulates bodily sensation. The body remembers because *emotion evokes place*—where were you on 9/11? Where did you have your first kiss? Your first child?

Action point: Create spaces for a simple, powerful, memorable moment that reinforces sensory pleasure from childhood or adolescence....A walk on the grass bare-foot... Other ideas?

Step 3—Nature, not landscaping: Real needs, real places

Using the outdoor areas and making a “home-like” environment are 2 efforts that largely fail because we have not connected them. In a person’s own home the outdoors is self-explanatory; it is useful, and therefore used, because it serves real purposes. It may be a necessity, a luxury, or even

an eyesore, but it definitely belongs to the person. In contrast, landscaping is a modern invention associated in their minds with government institutions, stately homes, or doctor’s offices—places nobody actually lives. Walking round the landscaped garden at the care home a resident asked, “Do they come out in here, patients? Do they, you know...?” Residents may feel they do not live in the home, in part because of the subtle meanings the building and the provision of care gives off. For instance, their perception of their life stage will determine their beliefs about the type of building it is and therefore its appropriate and allowable use.¹⁴

Action point: Give a resident an *ensuite* garden. Encourage their relatives to help plant and maintain it, grow tomatoes, and feed the birds.... Other ideas?

CONCLUSION AND FUTURE DIRECTIONS

Although design for dementia care environments has evolved substantially, the importance of nature to people with dementia themselves is less understood. This has led

to a diminished connection between residents and the outdoor world, because controlling behavior and managing risk have often taken design priority.¹⁵ It is perhaps time to move beyond designing in order to control, affect, or diminish “problem” behavior, and toward attempting to understand how environments can actively encourage pleasurable and satisfying behavior, for everyone who lives or works within or near them. An ecological approach to evidence-based design has been illustrated with case study examples from residential dementia care, using research methods that engaged the residents directly in conversation, while observing the complex energies and dynamics at work in the care environment. The design approach is upheld theoretically by person-centered and relationship-centered literature.^{16–19} An ecological approach to evidence-based design requires new research methodology and assessment tools specific to dementia care environments. Furthermore, evaluation is crucial if we are to build a theoretical base, so that positive outcomes can be verified, comparisons between different types of care settings can be drawn, and findings can infuse the design process.

This article argued for a research paradigm that looks beyond the *what* of design criteria—such as access—and investigates instead the *how* and *why* of human interaction—the synergy of person, plants, and place. We then presented design criteria derived from ecological research methods, giving examples in which physical elements and human uses could be integrated into daily life in ways that livened up the edge of the home. By doing this, we believe that frequent, pleasurable contact with nature can be increased

for the residents, staff, and families. And finally, the article offered some “steps” to take with residents, families, and staff to stimulate curiosity and provide opportunities for normal life. These are offered as a reminder that emotional and psychological needs for nature require a deeper level of investigation than physical needs, so if our focus remains with issues such as “access” we may be missing the rich emotional and spiritual landscape within the people who entrust us with their care.

Garuth Eliot Chalfont, BM, MA, ASLA, is a research assistant in the School of Architecture, University of Sheffield, UK, and is currently working on the INDEPENDENT Project (Investigating Enabling Environment for People With Dementia), which explores the potential for technology to improve quality of life.

Susan D. Rodiek, PhD, NCARB, is assistant professor in the Department of Architecture, Texas A&M University, where she is also Associate Director of the Center of Health Systems and Design. Dr Rodiek’s work is concerned primarily with the behavioral and psychological implications of environmental design, with an emphasis on residential facilities for older adults and particularly their usage of outdoor spaces.

Garuth Eliot Chalfont thanks the people with dementia and their families, and the management and staff of the care homes for their warmth and wisdom, and their willingness to share both.

Address correspondence to: Garuth Eliot Chalfont, BM, MA, ASLA, School of Architecture, Arts Tower, Western Bank, University of Sheffield, Sheffield UK S10 5BD. E-mail: g.chalfont.sheffield.ac.uk.

REFERENCES

1. Calkins M, Connell BR. Mary, Mary, quite contrary: how do you get people to use your garden? Paper presented at: Joint Conference of the National Council on Aging and the American Society on Aging; March 16, 2003; Chicago, Ill.
2. Cohen-Mansfield J, Werner P. Visits to an outdoor garden: impact on behavior and mood of nursing home residents who pace. In: Vellas B, Fitten LJ, eds. *Research and Practice in Alzheimer’s Disease*. New York: Springer Publishing Co; 1998:419–436.
3. McMinn BG, Hinton L. Confined to barracks: the effects of indoor confinement on aggressive behavior among inpatients of an acute psychogeriatric unit. *Am J Alzheimer’s Dis*. 2000;15:36–41.
4. Mooney P, Nicell PL. The importance of exterior environment for Alzheimer residents: effective care and risk management. *Healthcare Manage Forum*. 1992; 5(2):23–29.
5. Rodiek SD. Influence of an outdoor garden on mood and stress in older persons. *J Ther Horticul*. 2002; 13:13–21.
6. Cohen-Mansfield J, Werner P. Outdoor wandering parks for persons with dementia: a survey of characteristics and use. *Alzheimer Dis Assoc Disord*. 1999; 13(2):109–117.
7. Connell BR. *Health Benefits of Going Outdoors Among Nursing Home Residents*. Vol 15. Washington, DC: Department of Veterans Affairs, Research and Development; 2002.
8. Hiatt LG. Moving outside and making it a meaningful experience. In: *Nursing Homes: A Country and Metropolitan Area Data Book*. Rockville, Md:



- National Center for Health Statistics; 1980. US Govt Printing Office: Public Health Services Publication No. 2043.
9. Milligan C, Gatrell A, Bingley A. "Cultivating health": therapeutic landscapes and older people in northern England. *Soc Sci Med*. 2004;58:1781-1793.
 10. van Loon M. Grey and green in the Netherlands: research supporting the value of nature-based activities for elderly people. *GrowthPoint*. 2004; (99):6-7.
 11. Alexander C, Ishikawa S, Silverstein M, Jacobson M, Fiksdahl-King I, Angel S. *A Pattern Language*. New York, NY: Oxford University Press; 1977.
 12. Gehl J. *Life Between Buildings: Using Public Space*. Copenhagen: Arkitektens Forlag; 2001.
 13. Chalfont GE. Current research on connection to nature: implications for garden design in dementia care. *The Garden Design Profess Interest Group Newslett*. 2004;4-6.
 14. Chalfont GE. Reconnecting with nature. *J Dementia Care*. 2005;35.
 15. Parker C, Barnes S, McKee K, Morgan K, Torrington J, Tregenza P. Quality of life and building design in residential and nursing homes for older people. *Ageing Soc*. 2004;24:941-962.
 16. Gilleard CJ. *Living With Dementia*. London: Croom Helm; 1984.
 17. Goldsmith M. *Hearing the Voice of People With Dementia: Opportunities and Obstacles*. London: Jessica Kingsley Publishers; 1996.
 18. Kitwood T. *Dementia Reconsidered: The Person Comes First*. Buckingham: Open University Press; 1997.
 19. McKee K. Living with dementia and the problem with personhood. *Generations Rev*. 2005;15(1):8-11.

