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This paper reviews the current state of housing for people with dementia by exploring housing choices available to this group, and identifying potential issues with design of care homes. Older people who wish to age in place are faced with the challenge of adapting their domestic environment to ensure independence, accessibility and social connectivity. This is even more challenging for people with dementia who continue to live at home given the risks of self-harm and getting lost. More imaginative and inclusive forms of collective housing are needed. For people with dementia a move to a new environment is often a stressful experience that causes shock, withdrawal and anger. Hence more research is needed to develop more fitting long term housing options for people with dementia.

The paper presents a brief review on housing choices and housing design for people with dementia. Interviews with managers of 22 care homes were conducted to explore housing choices and design issues. Results show that the main housing choices available to people with dementia offer different levels of care. The choice of care homes relates to the atmosphere of a home as some occupants favor a homely or relaxing environment and others prefer dynamic settings. A combination of appropriate level of care, a good atmosphere and design quality within the care home are elements that lead to a more enabling environment. Design of a successful caring environment also requires appropriate care and a positive therapeutic and domestic looking environment.

Response to Reviewers: PLEASE SEE ATTACHED TABLE.
Housing choices and care home design for people with dementia

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Keywords:
Housing; dementia; care home; enabling environments; Lancashire.
Abstract

This paper reviews the current state of housing for people with dementia by exploring housing choices available to this group, and identifying potential issues with design of care homes. Older people who wish to age in place are faced with the challenge of adapting their domestic environment to ensure independence, accessibility and social connectivity. This is even more challenging for people with dementia who continue to live at home given the risks of self-harm and getting lost. More imaginative and inclusive forms of collective housing are needed. For people with dementia a move to a new environment is often a stressful experience that causes shock, withdrawal and anger. Hence more research is needed to develop more fitting long term housing options for people with dementia.

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Results show that the main housing choices available to people with dementia offer different levels of care. The choice of care homes relates to the atmosphere of a home as some occupants favor a homely or relaxing environment and others prefer dynamic settings.

A combination of appropriate level of care, a good atmosphere and design quality within the care home are elements that lead to a more enabling environment. Design of a successful caring environment also requires appropriate care and a positive therapeutic and domestic looking environment.
**Reviewer's comment** | **Authors’ response**
---|---
Reviewer #1:  
Section 1 is challenging to follow. I would have expected to see the aim of the paper very early on. Because there was no mention of the aim, I had no way to frame the purpose of the background / literature review. Perhaps because of that, I found Section 1 to be long and rather unfocused. I think you could shorten the section quite a bit. There seem to me to be 3 points in a string of logic motivating this work - around which you could structure Section 1: 1) Individuals with dementia would likely like to live at home, but often cannot, 2) Current (non-home) housing situations are non-ideal for people with dementia, so 3) We need to better understand how to design non-home settings for people with dementia. This work aims to help satisfy #3.  
A paragraph has been added at the beginning of the paper to state the aims. 
Some sections on older people have been removed. Now Section 1 is primarily on people with dementia. 
Restructured Section 1 as per Reviewer 1’s comments. There are now three headings:  
- The challenges of living well at home with dementia.  
- Current housing options and their inadequacies for people with dementia.  
- Design of care settings for people with dementia  
In Section 1, there are not good transitions between discussions of older people as a group versus older people specifically with dementia. I think outlining your logic in some way would help you with these transitions.  
Restructured (as described above) to help with the transition and flow of the text. This seems more logical and sets the context of the challenges of ageing in place with dementia, then how current housing options are inadequate and how care settings may better suit this need. This then leads onto the interviews which explore design of nursing homes and how they may better fulfil the needs of the residents with dementia.  
In the first paragraph, I am not sure what the authors mean by "sheltered housing" and "the Eden alternative"  
We have defined sheltered housing in paragraph 1. Information on the Eden alternative and a reference to the Green House have been added.  
The final paragraph of Section 1 you state “The next sections present the research methods and the analysis used in this paper in order to answer the research question that is concerned with housing options available to people with dementia and the potential design issues linked to the residential environments within care homes” but you have never stated the research question.  
At the end of Section 1 we have stated the research question.  
I need more details on how you chose the interview questions. Most could be answered with yes/no, so I need to better know how you conducted the sessions.  
We have explained this in Section 2: Methods.  
I would also like more detail on how many researchers coded the interviews and generated themes, how differences were resolved, etc.  
We have given more detail about the coding of the interviews.  
Figure 1 is unnecessary  
We have deleted figure 1.  
I can’t read the text in some of Figures 2-4  
We increased the size of the text in all our figures.  
Please include limitations and future work into Section 4  
A paragraph has been added to the end part of the conclusion. Lines 531-534  
Our scope is in one geographical area. Future research should test the design recommendations we made relating to atmosphere/quality of design e.g. colour/lighting/aesthetics (Some of the items identified in our figures).  
Reviewer #2:  
While the topic of housing for dementia patients is very timely, I do not feel this article provides much in the way of new information/findings. The work would benefit from a more detailed literature review of recent research on dementia and housing. I appreciated the research methods utilized in the research. The use of qualitative methods provides rich, descriptive data.  
We believe that the literature review is comprehensive and includes the most recent research on dementia and housing choices for older people.  
78 leading research papers on housing for dementia people have been reviewed for the purpose of this paper. Of which 57 have been referenced in the paper.
**Reviewer #3:**

| Line 343-345 - I'm sure is accurate but likely needs to be restated - ie. Locked doors (at least in the this country are against the law) I don't know that it should be excluded (there is probably more of this happening than we would like to know about) but if I am not mistaken - it is illegal. [I have little doubt of the accuracy and it may be legal there (this was Great Britain I believe) - and I believe there is benefit to inclusion - just insure it is well stated - | We have addressed the issue of locked doors in the text. There was a misunderstanding here. Patients were not locked into internal rooms. |
| The information (especially as a comparative) is beneficial - 404] discussion of locking residents in their rooms - again is not legal in the here (USA) - I'm not suggesting it be omitted but again be very careful and clear in the statements - | See above. |
| Conclusion - overall - very good - ie: 425-428 re: suggestion of need for alternate housing design - if appropriate the small house design grouping originated by Bill Thomas (The Green House) - might be an appropriate inclusion - addressing advancing dementia - appropriate size, staffing, activity etc. It was not designed specifically for persons with dementia but the design, staffing etc. can be ideal. I am also not necessarily suggesting it be included - perhaps a follow up | Reference to the Green House has been added to Section 1. |

**Reviewer #4:**

| Information on the managers' facilities: 1. Scale of facility or home | Not all nursing homes information suggested by Reviewer 4 was relevant to the study. We have inserted a table in the methodology section to describe the care homes with the information obtained during interview i.e. number of beds and type of home. |
| a. 'appropriate' level of care: compared to what? Does not define the level of dementia that would be tied to a level of care, which would be measurable. | We have added a sentence to explain this. Line 312 |
| b. 'good' atmosphere is subjective terminology and not completely defined. Understand that there are components that contribute to an atmosphere that would be beneficial to residents with dementia. Would define these terms better in the reporting. | In order to describe 'good' atmosphere we have stated in the text that this is subjective but people still expect their care homes to feel homely as opposed to clinical. Lines 330-331 & Line 379. Lines 517-520. |
| c. design 'quality' is also not completely defined. Would recommend the factors that contribute to a beneficial design be laid out more clearly. | We have defined design quality. Factors that contribute to a beneficial design are clearly displayed in figure 3. Lines 398-401 |
1. Background

There is no doubt that one major challenge of population ageing is the development of more imaginative and inclusive forms of collective housing. Older people who wish to age in place often need to adapt their domestic environment to ensure independence, accessibility and social connectivity. This is increasingly challenging for people with dementia who live at home given the risks of self-harm, such as falls, leaving cooking appliances or taps running and getting lost. For a person with dementia a move to a new environment such as a nursing home is often a stressful experience, causing shock, withdrawal and anger. Despite recent development in dementia-friendly environments, more research is still required to develop more fitting long term housing options for people with dementia. This paper presents a review of the current state of housing for people with dementia by exploring housing choices available to this group, and identifies potential issues with design of nursing homes in the UK context through interviews with facility managers.

The challenges of living well at home with dementia

Most people with dementia live in their private homes while being cared for by relatives. However because of rapid cognitive decline and consequently the risks of self-harm and getting lost, a substantial number of older people with dementia will need to move to nursing homes where care and support is provided (Matthews & Dening, 2002; Wittenberg, Comas-Herrera, Pickard, & Hancock, 2004; Torrington, 2009).

Access to healthcare, support and social services for older people from their own home are vital as they prevent the need to move. Community and family connections and place or home attachment help older people to feel psychologically safe in familiar surroundings (World Health...
Organization, 2007). It is not surprising thus to know that older people wish to age in place and
remain in their community where they have established social networks (Burholt, 2006).

THIS IS THE PULL-OUT QUOTE. This is the pull-out quote: RUBINSTEIN (1989) ALSO
ACKNOWLEDGES THAT OLDER PEOPLE PREFER TO REMAIN IN THEIR OWN
HOMES TO MAINTAIN THEIR INDEPENDENCE AND PERSONAL FREEDOM, DESPITE
THE ONSET OF AGE RELATED IMPAIRMENTS.

Although it is desirable to remain living at home, it is not always practical as Reimer, Slaughter,
Donaldson, Currie, & Eliasziw (2004) acknowledge that people with dementia are often moved
into long term care settings for the following reasons: an increased cognitive decline; an interest
in improving the wellbeing of the person with dementia; and the need to provide extra support to
the person with dementia and their caregivers. Due to a loss of cognitive ability, a suitable
designed physical environment is recognised as important in overcoming behavioural issues,
providing comfort, assisting with wayfinding and promoting independence. This is because the
experience for a person with dementia becomes more sensory than intellectual (Hadjri, Faith, &
McManus, 2012; Joseph, 2006). For people with dementia their condition and associated
symptoms are known to be influenced by the physical environment (Ebersole, Hess, & Schmidt-
Luggen, 2004; van Hoof & Kort, 2009). Hence the importance of an enabling environment that
offers opportunities for change and optimum stimulation (Cohen & Weisman, 1991; Calkins M.,
1995).

Research shows that the built environment can create significant challenges to people with
cognitive disabilities such as dementia (Jackson & Kochtitzky, 2001). This is why dementia
requires evidence based design solutions to adapt the home environment (van Hoof, Kort,
Duijnste, Rutten, & Hensen, 2010). Nowadays designers and facility managers recognize that
the design of the physical environment is important in contributing to the wellbeing and functionality of people with dementia (see Brawley, 1997; Calkins M. P., 1988; Cohen & Day, 1993; Cohen & Weisman, 1991; Day, Carreon, & Stump, 2000). People with dementia normally require adaptation to the design of housing facilities, their indoor environment and any technology that is used to monitor residents or support care delivery (van Hoof, Kort, Duijnstee, Rutten, & Hensen, 2010).

From the perspective of the person with dementia, moving into a nursing home is not desirable because of the consequences of leaving their familiar environment, social network, loss of independence and the fear of the unknown – adjusting to communal living, a new environment, and away from the family and friends (Davies & Nolan, 2004). Furthermore, there are behavioral patterns associated with the move to nursing home settings, such as older people with dementia spending more time in their private rooms during the day (Fleming & Purandare, 2010).

It has been shown that a person with dementia that has been moved to a new environment tend “to suffer higher rates of depression and mortality following relocation” (Day, Carreon, & Stump, 2000, p. 398). Findings from other research shows however that when people with dementia are moved together to a new facility, they seem to suffer less from the impacts of relocation (Anthony, Procter, Silverman, & Murphy, 1987; McAuslane & Sperlinger, 1994; Robertson, Warrington, & Eagles, 1993; Day, Carreon, & Stump, 2000). Whatever the case, generally a person with dementia experiences shock, withdrawal and anger immediately after the move to a nursing home (Davies & Nolan, 2004). The move to a nursing home is a very stressful experience to both the person with dementia and their carer, given the fact that it is a major life event. Most of the time the carer has to decide on the best housing and care options (Davies & Nolan, 2004).
Current housing options and their inadequacies for people with dementia

It is inevitable that as people age mainstream housing becomes increasingly inadequate (Wright, Tinker, Hanson, Wojgani, & Mayagoitia, 2009). In the UK, there are five dominant housing types: own home/other family home; sheltered housing; very sheltered housing; long-stay residential care; end-of-life care (O’Malley & Croucher, 2005). Sheltered housing usually consists of private and secure units that are monitored by a warden (Hadjri, 2010). They are commonly occupied by vulnerable, older people or disabled residents. With the aim to improve the quality of life of older people with disabilities, several new home-like housing models have been developed such as assisted living, continuing care retirement communities and the Eden Alternative (Joseph, 2006). The Eden Alternative aims to create homelike settings in nursing homes by enabling residents to interact with nature and people. This is achieved by empowering staff to implement these changes and ensure residents have a better quality of life (Coleman, Looney, O’Brien, & Ziegler, 2002). In line with this philosophy, the Green House Project was initiated and introduced a new approach to long-term residential care for eight to ten older people; that is a facility smaller in size and homelike in terms of interior design and daily activities (Thomas & Johansson, 2003).

Clough, Leamy, Miller, Bright, & Brooks (2005) argue that the lack of housing option presents itself as an obstacle to older people moving to more suitable housing, or as Brenton (2001) and Dalley (2002) noted due to a need for “more imaginative forms of collective housing”. Other authors such as Oldman & Quilgars (1999) argue that for some people, moving into residential care can be a positive experience (Means, 2007). This is true for some older people with dementia who managed to improve their quality of life after moving to a nursing home (Means,
More research has concluded that older people who moved into extra care housing required less care (Croucher, Hicks, & Jackson, 2006; Wright, Tinker, Hanson, Wojgani, & Mayagoitia, 2009). On the other hand, some authors recommend that the move take place as early as possible after a person is diagnosed with early dementia, this is to avoid stress and confusion which tend to happen when older people with moderate to severe dementia are moved to nursing homes (van Hoof & Kort, 2009).

Marquardt & Schmieg (2009) highlight the major reasons for a person with dementia needing to move into nursing care relate to a loss of independence and problems with wayfinding. This move is necessary in most cases despite efforts from family and concerned older people to remain at home for as long as possible. Some of the deciding factors are concerned with increased care needs, high carer burden, cognitive decline and behavioral issues for example (Banerjee, et al., 2003; Reimer, Slaughter, Donaldson, Currie, & Eliasziw, 2004). Recent research has used individual and behavioral approaches to understand the critical factors leading to institutionalization for people with dementia (Butler, Orrell, & Bebbington, 2002; Gaugler, Kane, Clay, & Newcomer, 2003). Carers highlight that it is common to see older people with dementia being constantly moved between care homes because of lack of qualified staff who can care for people with dementia (Department of Health, 2009). However, more evidence is needed such as longitudinal research in order to “to explore pathways of housing and care for people with dementia” and to understand the decision-making process before relocation (O’Malley & Croucher, 2005, p. 574). It appears however that extra care housing in the UK can provide a long term alternative to institutional care for people with dementia if adequate specialist care is available (Molineux & Appleton, 2005).
THIS IS THE PULL-OUT QUOTE. This is the pull-out quote: THERE HAS BEEN AN INCREASE IN SERVICE PROVISION TO SUPPORT CARE AT HOME FOR PEOPLE WITH DEMENTIA INCLUDING FOR THOSE WITH SEVERE DEMENTIA. Nonetheless more studies are needed to establish the cost-effectiveness of these approaches to care (O’Malley & Croucher, 2005).

Design of care settings for people with dementia

The Bamford review consultation with service users and their carers raised issues such as ageing in place. It is desirable to enable people with dementia to remain at home for as long as possible in order to delay the move to a nursing home which in most cases is inevitable. This can be achieved if assistive technologies and adequate adaptation of the homes are available (Northern Ireland Government, 2011). For those who have to leave their home, a community based model of supported housing is available where people with dementia can continue to live relatively independently (Northern Ireland Government, 2011). However, more research is needed to ascertain if this type of accommodation and model could be a long term option.

Nursing homes with fewer units or small grouping for people with dementia are more desirable as they minimize overstimulation caused by noise and large number of people potentially in contact with residents (Day, Carreon, & Stump, 2000). Additionally, design improvements can be implemented to improve wayfinding through better signage, use of landmarks and views to outdoors (Day, Carreon, & Stump, 2000). Quality of indoor spaces can also be improved to avoid confusion of people with dementia through better contrast on floors and walls and better lighting (Brawley, 1997; Day, Carreon, & Stump, 2000). This is echoed by other authors such as Weisman (1987) and Diaz Moore, Geboy, & Weisman (2006). Wayfinding for example can be improved through efficient signage, better floor plan layouts, more effective design for
perceptual access (Marquardt, 2011). Moreover, floor plan typology and environmental cues are key in aiding wayfinding (Marquardt, 2011; Elmståhl, Annerstedt, & Ahlund, 1997; Marquardt & Schmiege, 2009; Passini, Pigot, Rainville, & Tétreault, 2000; Passini, Rainville, Marchand, & Joanette, 1998). For example, people with dementia are more comfortable, less aggressive and sleep better if they have their own private room rather than sharing a bedroom (Morgan & Stewart, 1998; Joseph, 2006).

Hence care facilities must continue to improve the design of their accommodation, particularly for people with dementia to minimize the effect of the disease on their cognitive abilities and quality of life. For instance, research on housing needs of people with dementia experiencing the various stages of the disease could be useful (Alzheimer’s Australia, 2004).

Another option would be to assess the potential of sheltered housing to offer an alternative housing option to people with dementia. Sheltered housing has the potential to offer a positive environment for people with dementia if there are adequate opportunities for social interactions (Department of Health, 2009, p. 55). There is a need now for interdisciplinary research that examines further the relationship between housing and dementia and associated care (Heywood, Oldman, & Means, 2002; Cantley, 2001; Manthorpe & Adams, 2003).

Still more research is needed to develop more fitting long term housing options for people with dementia. This can be achieved by involving this user group and their carers in the development of these alternatives, and by monitoring the development of models, training staff in care delivery at home, and identifying which assistive technology and telecare options have potential for implementation (Department of Health, 2009).

The next sections present the research methods and the analysis used in this paper in order to answer the research question: What are the main housing options available to people with
dementia? Alongside this, potential design issues linked to the residential environments within care homes will be explored.

2. Methods

A list of care and nursing homes operational in [location hidden for peer review] was produced to identify those that currently care for people with dementia. [location hidden for peer review] has 329 care homes located in 31 urban or rural settlements in [location hidden for peer review]. These offer 11,202 beds. Of these homes, 305 are private while 15 are under local authority control, and nine are run by voluntary organizations. Of the 329 homes, 165 provide care for people with dementia. Managers of this latter group were contacted by phone to gauge their interest in the study and ask them whether they will be willing to be interviewed. Twenty two managers agreed to be interviewed within two weeks. Table 1 below offers a brief description of the managers’ care home facilities:

<table>
<thead>
<tr>
<th>Participant code name</th>
<th>Number of beds</th>
<th>Type of care</th>
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<tbody>
<tr>
<td>A</td>
<td>50</td>
<td>Old Age Dementia</td>
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<tr>
<td>B</td>
<td>11</td>
<td>Old Age Dementia</td>
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<td>C</td>
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<td>Dementia Mental Disorder</td>
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<td>Dementia</td>
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173 Ethical approval for the interviews was obtained from the University of [location hidden for peer review] Ethics Committee prior to the fieldwork starting. As a result a participant information sheet and consent forms were produced in preparation for the interviews.
The interview questions were developed based on findings from the literature review and previous research by the authors, and were concerned with housing choices and potential design issues of existing nursing homes. The interview schedule contained nine questions as follows:

1. Housing Choices: what are the decisive factors in terms of older people’s choices of moving to nursing homes, and why?
2. Do you think that nursing homes design needs to address new requirements related to accessibility, comfort, or health and safety or not?
3. Are you aware of any environmental, social, behavioral and healthcare issues caused by the design of care environments?
4. Are you aware of any best practice in the design of care environments for people with cognitive impairments/dementia?
5. Do you think that the design of the physical environment matters and makes a difference to people who suffer from dementia and their carers or not?
6. Has a Dementia Design Audit been carried out or not (DSDC Dementia Services Development Centre, University of Stirling)?
7. Do you have any comments on the layout and general design of the facility?
8. Do you think staff needs training (communication) in order to care for people with dementia or not? Are there any staff related issues that may impact on care delivery? Nursing, training, education?
9. How would you decide on a personalized care in relation to the physical and social environment?

Interviews with managers of 22 nursing homes were therefore conducted to explore design and housing choices issues for people with dementia. Interview conditions such as timing were tested
through pilot interviews. They were carried out in comfortable and familiar settings at agreed times to help participants to feel at ease. The purpose and duration of the interviews were explained to participants at the start of the interviews. Researchers followed the advice of Kane & O’Reilly-De Brun (2001), who state that the behavior of the interviewer is important. Therefore during interview sessions researchers remained as neutral as possible and encouraged responses with non-committal body language. The researcher did not interrupt participants and allowed silences to give respondents time to think.

The interviews were tape recorded and lasted between 30 minutes and an hour. Interviews were then transcribed verbatim and analyzed using NVivo. Thematic analysis was used to examine the choice of dementia care homes available and the design issues associated with them. The analysis was carried out in line with guidelines as outlined by Braun & Clarke (2006). Firstly, the interviews were transcribed from tape recordings into both electronic and printed forms. The second phase was to familiarize oneself with the data; this involved reading and re-reading the text. Similarities, differences and contrasts between transcripts were noted. Thirdly, initial codes were generated. This involved writing in the margins of the texts and similar codes were assembled together in a process described by Saldaña (2009). Fourthly, themes were sought and a record of all emergent codes was kept in the NVivo 10 software program for organizational purposes. In the fifth phase the themes were reviewed; themes that the researchers felt did not support enough data were discarded, whilst themes that were too broad were subdivided. Finally, themes were re-arranged to form clusters of organizing themes and global themes. Diagrams were developed using the same software to summarize the findings of this study and to depict themes (Figures 1-3). To ensure reliability, consistency and to minimise bias interviewers were coded collaboratively between three members of the researcher team. This process involved the
cross-checking of codes and interpretation of data between researchers (Barbour, 2001).

Researchers agreed or refined themes and codes at regular meetings where they also posed provocative questions to generate new codes. Differences of opinions concerning the definition of themes were resolved through intensive group discussions. As recommended by Saldaña (2009), one member of the researcher team acted as a code book editor which involved revising and maintaining the master list of themes for the group.

3. Analysis

In addressing the research question about the housing choices available to people with dementia and the design issues associated with these, this paper focuses on three particular, but interconnected aspects of participants’ experiences of care homes. These are: the level of care required by a resident, the atmosphere of a home and the design quality of a care home.

Level of care required

Participants stated that residents made the decision to move to a care home for a variety of reasons including a need for extra support, safety concerns, health challenges and an inability to cope at home. It was acknowledged that people moved to care homes out of necessity and that very few people viewed it as a positive lifestyle choice. In many cases the decision to move was reached by social workers, family members or hospital staff. Participants maintained that despite the help of community support teams, residents with dementia came to a stage where they found it too challenging to cope at home. Therefore occupants needed the extra support that a care home afforded them:
“I think...people move here because...they are not able to manage themselves independently or their relatives are sort of...struggling to cope with their needs. I think a lot of the time...it’s...the last resort for many people” (Participant K).

Some participants noted that people who had dementia required extra care and care homes afforded provision of 24-hour support and expertise which they may not receive at home. In terms of safety, many participants commented that residents can “wander” due to dementia.

IN LIGHT OF THIS, CARE HOMES WERE VIEWED AS SAFE ENVIRONMENTS BY RESIDENTS BOTH IN TERMS OF LAYOUT, DESIGN OF BUILDINGS AND ALSO DUE TO THE PROFESSIONAL CARE OFFERED BY STAFF. When selecting a residential care home, occupants considered the safety aspects of the home:

“They then look for...a...safe environment, so that the initial safety will be secured, they cannot just walk out of the door” (Participant B).

Others believed that the building design was fundamental to maintaining safety in care homes as residents required an environment protecting them from injury, yet allowing them to feel safe while maintaining their mobility. The choice of home was based on the individual’s required level of care for example different residents required various equipment items, many had lived in a care home before while others had not and others had multiple impairments. Various occupants had different levels of dementia and many participants commented that residents elected to live in homes with individual or personalized care plans:

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1 “Wandering (or exploring) is a term that refers to a type of persistent walking behaviour that may occur as a result of dementia. It may appear to be aimless but the person with dementia may be walking with a purpose.”
“We offer person-centered care by meeting the needs of individual residents based on their life history and the information we gather about them” (Participant U).

Care plans were developed through consultation with family members, doctors or friends. Plans were sometimes altered and reassessed according to occupants’ changing needs. Some participants stated that the care homes in which they worked had rooms of varying sizes and decor to suit a diverse range of residents. Applicant’s background as well as mental and physical needs are assessed before making an offer to them. The choice of home was also based on selection criteria for example care homes had exclusion and inclusion criteria that were based on the level of care required by the future occupant. Participants said that residents checked for specific facilities provided, for instance physiotherapy rooms, when selecting a home. They also considered the level of communication between residents and care home staff:

“We take the lead from them, listen to them and address their comments. They scrutinize the person-care plan. If they feel that there is something missing generally in our care plan, we address and report back to them” (Participant N).

However, most participants did not produce audits in the workplace. An inhabitants’ background influenced their selection for instance if a home related to their birthplace or met with their individual taste. Care workers try to get a history of the occupant’s previous lifestyle and relate it to their new environment. If someone was interested in gardening then they chose homes with a garden and staff encouraged them to participate in activities in the garden.

Leaving design considerations aside, participants asserted that staffing influenced future occupants’ choice of care home. They believed that working in a care home was a vocation and that staff should be sympathetic and caring towards residents. They required an understanding of the effects of dementia: “You can’t train somebody to love and care” (Participant D).
Participants discussed the importance of a balanced staff to occupant ratio for safety of residents. Existing homes had staff to resident ratios of 1:3 or 1:5. Experience and training received by staff were also important considerations. Many participants were involved in internal and external training. This also incorporated learning about communication to improve the level of care in a home. Participants noted that residents had the opportunity to choose homes where National Vocational Qualification (NVQ) training and Continuing Professional Development (CPD) training took place. One participant had put a personalized training scheme in place that was adapted to meet resident’s needs. There was an overriding requirement for suitable staff to meet the care needs of occupants:

“What is the use of adapted buildings if you have not got the staff to look after dementia residents? You must treat them and have a passion for the dementia” (Participant F).

Participants stated that the choice of homes was based on both the building design and the quality of staff available. A well-designed building was ineffective alone without appropriate staffing. Participants reported that residents sometimes moved to more specialized homes as their dementia symptoms increased and some homes catered for some or all stages of dementia. In line with this, one participant changed the registration of their care home to meet dementia needs. Other participants mentioned homes that employed dementia strategies for occupants to choose from and many used diary sheets to keep track of a resident’s needs. However, another participant felt that there was little choice for couples who wished to live together in a care home:

“New homes are built to have just one person in a room. So what happens when you get a married couple...You haven’t even got a choice” (Participant P).
All of these factors impacted upon future residents’ choice of care homes yet it appeared from interview analysis that a variety of choice was available for future tenants, however in many cases, their selection depended on the level of care they required and their individual preferences. The choice of home was linked to the type of care that the care-home catered for (Table 1). Figure 1 summarizes the subthemes associated with level of care required.
Atmosphere

A common issue facing housing choice was the atmosphere perceived by residents in care homes. Whilst the feelings conveyed by one’s environment are in many ways subjective, participants outlined features that could contribute to a positive atmosphere for residents. THIS IS THE PULL-OUT QUOTE. This is the pull-out quote: PARTICIPANTS STATED THAT OCCUPANTS WISHED TO LIVE IN HOMELY ENVIRONMENTS. IT WAS IMPORTANT THAT DESIGNERS ENSURED THAT CARE HOMES ARE PERSONALIZED TO HELP THEM TO ‘FEEL AT HOME’:
“FROM A COMFORT POINT OF VIEW, IT HAS TO FEEL AND BE LIKE A HOME WHERE OLDER PEOPLE FEEL FAMILIAR WITH” (PARTICIPANT A).

Participants encouraged family members and residents to bring familiar objects to the home such as flowers, pictures and ornaments and some residents brought their own furniture to enhance the bedroom. They decorated public areas and planted flowers outside to make residents feel welcome. Participants noted that occupants had the choice between purpose built and pre-existing homes. There was a feeling amongst some participants that newer homes had a more clinical feeling than older buildings. When choosing a color scheme, warm colors were selected and there was an attempt to use furniture and fittings that were found in a home environment. There was a sense that the design of a home could have a positive effect on both staff and residents:

“The design does matter for carers and dementia residents. It raises staff morale, because people enjoy coming to work because the environment is friendly, homely and comfortable. That happiness also affects the residents” (Participant K).

Other participants stated that their care homes had a holiday atmosphere as the bedrooms were decorated similarly to a hotel. Overall the care homes’ staff aimed to avoid clinical decor to maximize residents’ comfort as the design of the built environment could reduce the stress experienced by people residents with dementia. Participants aimed to provide relaxation and happiness to residents. One participant believed that care homes should offer residents the opportunity to choose their own bedroom. Bedrooms were nonetheless laid out to suit the individual. Some occupants felt more comfortable in smaller bedrooms yet others preferred larger bedrooms or did not spend much time there. Participants contended that residents chose homes in areas that were familiar to them: “Staying in an area that they are familiar with so that
care assistants can help them when going to shops” (Participant T). Participants felt that good aesthetics encouraged future residents to choose particular homes as their first impression related to homes decor which acted as a marketing tool. The decor in one home mirrored the culture of the residents:

“We have assorted appliances like African bathrooms, London bathrooms and French bathrooms that bring home memories to residents” (Participant K).

Participants revealed that different areas of the homes had different atmospheres. They facilitated people who liked to withdraw to tranquil, relaxing spaces by providing them with relaxation rooms and quiet sitting areas. They also provided private meeting rooms for families and sensory rooms. This was not the case with all homes but they sought to include these spaces in their layouts. The quiet rooms were in contrast to the lounge and dining areas that were included to encourage interaction between residents. Participants expressed the issues relating to perceived challenging behaviors which may present and the need to ensure this did not affect other occupants. This usually involves them identifying the cause or root of why residents are agitated/anxious/waking up in the middle of the night, and in response to this staff may facilitate something they want to do (go a short walk-related to their past employment, e.g. security guard). It was also noted that residents had the choice of staying in quiet areas or accessing activities in more public areas. They tried to instill a sense of community by expanding the numbers of lounge areas and organizing group activities such as tea parties, painting, music or games which also helped to prevent loneliness or isolation. Figure 2 below highlights the themes associated with the atmosphere of care homes. It includes components that contribute to an atmosphere that would be beneficial to residents with dementia.
Design quality

Aside from the emotional aspects in choosing available housing, participants also discussed design issues associated with them. Garmonsway (1991) defines quality as a degree of goodness, value or excellence. In architecture, design quality “embraces all the aspects by which a building is judged.” (Volker, 2014, p. 16)

In terms of design quality of nursing homes, key areas highlighted were wayfinding strategies, maintaining control, space, purpose built homes, lighting, color, and facilities. Participants also described negative housing choices available. They acknowledged that the design of the built
environment had an impact on the behavior of residents as it could either trigger or remove anti-social behavior. Furthermore, it was important to prevent residents from losing their way which was achieved through signage, pictures and the use of color:

"Door signs, photographs, color blinds on the floor and walls to follow, our bathroom doors have door frames painted in red to identify bathrooms, different seat colors, flooring etc."

(Participant J).

Participants used landmarks and images on the walls to help occupants to find their rooms and images used were often personal to the residents. All participants reported the importance of monitoring residents and the layout of a building’s design needed to respond to this. While many participants used locks on external doors to control the movement of occupants, it was more appropriate to design layouts where staff were able to monitor residents from their work stations:

"If you have a work station on the ground floor, you will see all the rooms, this would help to reduce the risk to the patients"

(Participant F).

One participant stated that there were areas in their home that were difficult to observe: "There are three areas where they can come down without anybody seeing them" (Participant L). Yet other designs enabled staff to observe residents with ease and Participant M stated that their design incorporated a wander path.

Participants determined that space was an important design issue in the choice of care homes and it was necessary to design rooms that accommodated equipment for handling purposes. One participant commented that, although rooms were built to meet the requirements of legislation, many were too small to accommodate equipment. Large spaces were required to allow residents freedom of movement, yet they would be less likely to get lost in smaller spaces. In some homes
bedrooms were extended to incorporate wet rooms and participants were satisfied with the results. However Participant P believed that en-suites were awkward as some residents were confused and thought that the toilet contained drinking water. Many participants wished to improve the corridor spaces in their care homes as they felt that they were often too long, and narrow and residents experienced difficulty when maneuvering in them. Whilst Participant K was satisfied that their home was spacious, they acknowledged that large spaces were confusing at times for dementia residents:

"It is a big building and could be confusing....But I think I am quite happy with the design, its lounge is quite spacious, there is room for people to walk in the large garden, go outside, floor level anytime" (Participant K).

Whilst many of the participants preferred to work in purpose built properties, many of the care homes were converted or adapted to meet residents’ needs. They compared the merits of purpose built properties to older homes:

"It is very difficult for things already built but in new modern buildings everything should be taken into consideration...Purpose built buildings will enable the architect to be more mindful of design requirements" (Participant G).

In the case of existing buildings, some participants were dissatisfied with the original designs and built extensions to improve the homes. There was a sense that purpose built homes were more likely to locate all the accommodation at ground floor level to prevent falls. Nonetheless older homes had a greater variety of room sizes and may have felt more homely.

The use of lighting and color in the home was highlighted and some participants were aware of past studies carried out in these areas. Participants updated existing homes by installing bright
lights and using indicative color schemes. For instance, some homes used color palettes where doors were assigned colors according to the function of the room and this helped the residents to identify rooms. Some participants felt that the color of the flooring in their homes should change from patterned carpets to a plain and less confusing surface and others maintained that the choice of colors had an impact upon the behavior of occupants.

THIS IS THE PULL-OUT QUOTE. This is the pull-out quote: IN TERMS OF FACILITIES PARTICIPANTS DISCUSSED THE USE OF SENSORY ROOMS AS THERAPY FOR ANXIOUS OR AGITATED RESIDENTS. THEY ALSO FAVORED THE INCORPORATION OF GARDEN SPACES IN CARE HOME DESIGNS AND VIEWED THEM AS ENCLOSED SAFE AREAS WHERE RESIDENTS COULD RELAX. In particular participants endorsed the design of sensory gardens in care homes:

“Sensory gardens are incredible....and provide the residents with access to walk around for about 5 to 10 minutes with something to look at. It’s calming and entertaining”

(Participant H).

Some homes were designed around bright, colorful and safe gardens and Participant U noted that their home included hair dressing, pub and cafe facilities to help residents to feel comfortable. The use of technology was important for another participant in ensuring that residents were safe and they installed sensors to monitor residents who are prone to getting up at night. It was important to ensure that facilities were fully accessible and some participants working in existing homes highlighted the stairs in their facility as a potential hazard. Some participants did not cater for occupants who used large four wheel chairs whereas other participants asserted that the shower facilities and en-suites were fully accessible in their homes. Furthermore, in some homes, people with dementia were accommodated on the ground floor and lifts were installed.
Participants described negative aspects of housing choices available and some participants were forced to use locks on external front doors to restrict the movement of residents. Designing homes which consider monitoring would reduce this problem: “But at the moment people are locked in and you tell them that they can’t leave, it affects their behavior” (Participant G). Some participants felt that there was limited availability of dementia accommodation for people under 65 and a need for a greater number of dementia care homes in the [location hidden for peer review] area. Many of the care homes were limited in terms of space with narrow corridors and one participant said that they would like to make their garden more dementia friendly.

Participants maintained that many homes were decorated in a clinical or institutional way. Not all homes had rooms with a variety of shapes and sizes. Variety was important to cater for a range of needs. It was challenging for homes to keep up to date with new trends or legislation and to adapt their homes accordingly. When construction work was taking place, it had the effect of confusing or upsetting some of the residents. Cost was a concern as smaller care homes sometimes struggled to fund building projects and also had to compete with consortium homes. It appeared also that smaller homes were more focused on customer care than profit. Figure 3 below highlights the themes associated with the design quality of care-homes.
Figure 3: Bubble Diagram depicting design quality
4. Discussion and Conclusion

One of the biggest challenges facing older people’s wish to age in place is the capability of their domestic environment to offer independence, accessibility and social connectivity. This is even more challenging for people with dementia who continue to live at home given the risks of self-harm and getting lost. Hence more imaginative and inclusive forms of collective housing are needed. If this is not achieved in the short term then a substantial number of older people with dementia will be forced to move to nursing homes. For people with dementia a move to a new environment is often a stressful experience that causes shock, withdrawal and anger.

Hence the design of the physical environment is important and can enhance behavioral, cognitive and comfort issues of people with dementia. Adapting home environments is therefore important to support the development of evidence based design solutions. There is no doubt nowadays that the design of the home environment has the potential to contribute to the wellbeing and functionality of people with dementia.

These issues were explored through semi-structured interviews with 22 managers of care homes in [location hidden for peer review] in order to explore design and housing choices issues for people with dementia. Findings suggest that there are three interconnected themes emerging from participants’ experience of managing a care home where some residents have dementia. These themes are concerned with the level of care required by the resident, the atmosphere of a home and the design quality of the care home. The level of care required was the main reason behind the move to a care home, this includes the need for extra support, health and safety concerns, and inability to cope alone at home. Ultimately the move to a care home is out of necessity and it is not viewed as a positive lifestyle choice. Care homes offer safe and caring
environments where residents can be safe and mobile. Personalized care plans also contribute to a better fit between the person with dementia and the service and environment provided by the care home. Training of carers emerged as an important aspect necessary to meet the care needs of residents.

The atmosphere provided by the care home was another important theme. Residents’ perception of this has to some extent guided the design, refurbishment and use of spaces in care homes. For example the domestic character of the home, the display of familiar objects, accessible gardens, quiet areas, and the use of warm colors.

Design quality of the care home is also an important factor likely to improve the general wellbeing of residents. Wayfinding cues, efficient lighting and color schemes for example are key aspects that can improve the way people with dementia use the physical environment. This can effectively reduce the risk of anti-social behavior and getting lost. Participants acknowledge that space design is an important factor in the choice of a care home. Facilities such as sensory rooms and sensory gardens are key elements of a dementia friendly home or an enabling environment. Some homes needed to be more inclusive in terms of mobility for wheelchair users while others had dangerous stairs. Locating residents with dementia on the ground floor seems a sensible measure to avoid accidents. Additionally, some homes installed sensors to monitor residents movements at night.

The study was limited to one county in England due to available resources. Future research will conduct a post-occupancy evaluation of these facilities using the DSDC Design Audit tool to establish the level of compliance in dementia nursing homes and suggest potential design improvements.
Implications for Practice

It emerged thus from this study that a combination of:

- a suitable level of care,
- a positive atmosphere, and
- design quality within the care home,
are elements that lead to a more enabling environment.

Design on its own will not lead to successful caring environment unless appropriate care is provided and a positive therapeutic and domestic looking environment is also available and accessible to people with dementia.
Implications for Practice

Design issues include the suitability of a home for wayfinding, the appropriateness of housing layouts, the amount of space afforded by a home, use of lighting and colour schemes. The study identified housing choices and design issues that affect people with dementia, and the main thematic areas that help achieve enabling environments. These themes are concerned with the level of care required by the resident, the atmosphere of a home and the design quality of the care home.

The design of the physical environment is important and is known to enhance behavioural, cognitive and comfort issues of people with dementia. Hence adapting care home environments is crucial in the context of supporting the development of further evidence based design solutions.
References cited:


1. Background

Housing choices for people with dementia

It is inevitable that as people age mainstream housing becomes increasingly inadequate (Wright et al., 2009). In the UK, there are five dominant housing types: own home/other family home; sheltered housing; very sheltered housing; long-stay residential care; end-of-life care (O’Malley & Croucher, 2005). With the aim to improve the quality of life of older people with disabilities, several new home-like housing models have been developed such as assisted living, continuing care retirement communities and the Eden Alternative (Joseph, 2006).

In terms of accommodation options for older people, affordability is a major factor in the decision process. The high costs associated with moving house is also another factor that discourages older people from moving to smaller homes (EAC, 2014). Access to healthcare, support and social services for older people from their own home is very important because it prevents them from needing to move. This is partly caused by place or home attachment and community and family connections available in the neighborhood; older people feel psychologically safe in familiar surroundings (WHO, 2007). It is not surprising thus to know that older people wish to age in place and remain in their community where they have established social networks (Burholt, 2006).

Clough et al. (2005) argue that there are obstacles that prevent older people from moving to better housing due to lack of housing options or as Brenton (2001) and Dalley (2002) noted due to a lack of “more imaginative forms of collective housing”. Other authors such as Oldman and Quilgars (1999) argue that for some people, moving into residential care can be a positive experience (Means, 2007). This is true for some older people with dementia who managed to
improve their quality of life after moving to a nursing home (Means, 2007). More research has concluded that older people who moved into extra care housing required less care (Croucher et al., 2006; Wright et al., 2009). On the other hand, some authors recommend that the move take place as early as possible after a person is diagnosed with early dementia, this is to avoid stress and confusion which tend to happen when older people with moderate to severe dementia are moved to nursing homes (van Hoof & Kort 2009).

THIS IS THE PULL-OUT QUOTE. This is the pull-out quote: IT IS KNOWN THAT THE PREFERENCE OF OLDER PEOPLE TO REMAIN AT HOME DESPITE AGE RELATED IMPAIRMENTS AND DECLINE IS MOTIVATED BY PERSONAL CHOICES AND NOTIONS SUCH AS INDEPENDENCE, NORMALCY AND CONTINUITY (Rubinstein, 1989). For people with dementia their condition and associated symptoms can be influenced by the living environment (Ebersole et al., 2004; van Hoof & Kort 2009).

Most older people with dementia live in their private homes while being cared for by relatives. However because of rapid cognitive decline and consequently the risks of self-harm and getting lost, a substantial number of older people with dementia will need to move to nursing homes where care and support is provided (Matthews & Dening, 2002; Wittenberg et al., 2004; Torrington, 2009)

From the perspective of the person with dementia, moving into a nursing home is not desirable because of the consequences of leaving their familiar environment, social network, loss of independence and the fear of the unknown – adjusting to communal living, a new environment, and away from the family and friends (Davies & Nolan, 2004). Furthermore, there are behavioral patterns associated with the move to nursing home settings, such as older people with dementia spending more time in their private rooms during the day (Fleming & Purandare, 2010).
Relocating people with dementia to new living environments is not desirable particularly if these are moved individually. Research shows that a person with dementia that has been moved to a new environment tend “to suffer higher rates of depression and mortality following relocation” (Day et al., 2000, p. 398). Findings from other research shows however that when people with dementia are moved together to a new facility seem to suffer less from the impacts of relocation (Anthony et al., 1987; McAuslane & Sperlinger, 1994; Robertson et al., 1993; Day et al., 2000). Whatever the case, generally a person with dementia experiences shock, withdrawal and anger immediately after the move to a nursing home (Davies & Nolan 2004). The move to a nursing home is a very stressful experience to both the person with dementia and their carer, given the fact that it is a major life event. Most of the time the carer has to decide on the best housing and care options (Davies & Nolan 2004).

This is the pull-out quote. This is the pull-out quote: FOR PEOPLE WITH DEMENTIA, A LOSS OF AUTONOMY AND DIFFICULTIES IN WAYFINDING ARE ASSOCIATED WITH THE MOVE TO UNFAMILIAR SETTINGS SUCH AS NURSING HOMES (Marquardt & Schmieg, 2009). This move is necessary in most cases despite efforts from family and concerned older people to remain at home for as long as possible. Some of the deciding factors are concerned with increased care needs, high carer burden, cognitive decline and behavioral issues for example (Banerjee et al., 2003). Recent research has used individual and behavioral approaches to understand the critical factors leading to institutionalization for people with dementia (Butler et al., 2002, Gaugler et al., 2003). Carers highlight that it is common to see older people with dementia being constantly moved between care homes because of lack of qualified staff who can care for people with dementia (Department of Health, 2009). However, more research is needed such as longitudinal research in order to “to explore pathways
of housing and care for people with dementia” and to understand the decision-making process before relocation (O’Malley & Croucher, 2005, p. 574). It appears however that extra care housing in the UK can provide a long term alternative to institutional care for people with dementia if adequate specialist care is available (Molineux & Appleton, 2005). There has been an increase in service provision to support care at home for people with dementia including for those with severe dementia. Nonetheless more studies are needed to establish the cost-effectiveness of these approaches to care (O’Malley & Croucher, 2005).

The Bamford review consultation with service users and their carers raised issues such as ageing in place. It is desirable to enable people with dementia to remain at home for as long as possible in order to delay the move to a nursing home which in most cases is inevitable. This can be achieved if assistive technologies and adequate adaptation of the homes are available (Northern Ireland Government, 2011). For those who have to leave their home, a community based model of supported housing is available where people with dementia can continue to live relatively independently (Northern Ireland Government, 2011). However, more research is needed to ascertain if this type of accommodation and model could be a long term option.

**Housing design issues for people with dementia**

This IS THE PULL-OUT QUOTE. This is the pull-out quote: THE DESIGN OF THE PHYSICAL ENVIRONMENT IS KNOWN TO AUGMENT BEHAVIORAL, COGNITIVE AND COMFORT ISSUES OF PEOPLE WITH DEMENTIA GIVEN THEIR INTERACTION WITH THIS ENVIRONMENT IS SENSORY RATHER THAN INTELLECTUAL (Hadjri et al., 2012; Joseph, 2006). Hence the importance of an environment that offers opportunities for change and optimum stimulation (Cohen & Weisman, 1991; Calkins, 1995).
Research shows that the built environment can create significant mobility challenges to people with disabilities such as dementia (Jackson & Kochtitzky, 2001). This is why dementia requires evidence based design solutions to adapt the home environment (van Hoof et al., 2010). Nowadays designers and facility managers recognize that the design of the physical environment is important and contribute to the wellbeing and functionality of people with dementia (see Brawley, 1997; Calkins, 1988; Cohen & Day, 1993; Cohen & Weisman, 1991; Day et al., 2000). People with dementia normally require adaptation to the design of housing facilities, their indoor environment and any technology that is used to monitor residents or support care delivery (van Hoof et al., 2010).

Nursing homes with fewer units or small grouping for people with dementia are more desirable as they minimize overstimulation caused by noise and large number of people potentially in contact with residents (Day et al., 2000). Additionally, design improvements can be implemented to improve wayfinding through better signage, use of landmarks and views to outdoors (Day et al., 2000). Quality of indoor spaces can also be improved to avoid confusion of people with dementia through better contrast on floors and walls and better lighting (Brawley, 1997; Day et al., 2000). This is echoed by other authors such as Weisman (1987) and Diaz Moore et al. (2006). Wayfinding for example can be improved through efficient signage, better floor plan layouts, more effective design for perceptual access (Marquardt, 2011). Moreover, floor plan typology and environmental cues are key in aiding wayfinding. (Marquardt, 2011; Elmståhl et al., 1997; Marquardt & Schmiegl, 2009; Passini et. al., 1998 & 2000). For example, people with dementia are more comfortable, less aggressive and sleep better if they have their own private room rather than sharing a bedroom (Morgan & Stewart, 1998b; Joseph, 2006).
Hence care facilities must continue to improve the design of their accommodation, particularly for people with dementia to minimize the effect of the disease on their cognitive abilities and quality of life. For instance, research on housing needs of people with dementia experiencing the various stages of the disease could be useful (Alzheimer’s Australia, 2004).

Another option would be to assess the potential of sheltered housing to offer an alternative housing option to people with dementia. Sheltered housing has the potential to offer a positive environment for people with dementia if there are adequate opportunities for social interactions (Department of Health, 2009, p. 55). There is a need now for interdisciplinary research that examines further the relationship between housing and dementia and associated care (Heywood et al., 2002; Cantley 2001; Manthorpe & Adams 2003).

Still more research is needed to develop more fitting long term housing options for people with dementia. This can be achieved by involving this user group and their carers in the development of these alternatives, and by monitoring the development of models, training staff in care delivery at home, and identifying which assistive technology and telecare options have potential for implementation (Department of Health, 2009).

The next sections present the research methods and the analysis used in this paper in order to answer the research question that is concerned with housing options available to people with dementia and the potential design issues linked to the residential environments within care homes.

2. Methods

A list of care and nursing homes operational in [location hidden for peer review] was produced to identify those that currently care for people with dementia. [location hidden for peer review]
has 329 care homes located in 31 urban or rural settlements in [location hidden for peer review]. These offer 11,202 beds. Of these homes, 305 are private while 15 are under local authority control, and nine are run by voluntary organizations. Of the 329 homes, 165 provide care for people with dementia. Managers of this latter group were contacted by phone to gauge their interest in the study and ask them whether they will be willing to be interviewed. Twenty two managers agreed to be interviewed within two weeks.

Ethical approval for the interviews was obtained from the University of [location hidden for peer review] Ethics Committee prior to the fieldwork starting. As a result a participant information sheet and consent forms were produced in preparation for the interviews.

The interview schedule contained nine questions as follows:

1. Housing Choices: what are the decisive factors in terms of older people’s choices of moving to nursing homes, and why?
2. Do you think that nursing homes design needs to address new requirements related to accessibility, comfort, or health and safety?
3. Are you aware of any environmental, social, behavioral and healthcare issues caused by the design of care environments?
4. Are you aware of any best practice in the design of care environments for people with cognitive impairments/dementia?
5. Do you think that the design of the physical environment matters and makes a difference to people who suffer from dementia and their carers?
6. Has a Dementia Design Audit been carried out (DSDC Dementia Services Development Centre, University of Stirling)?
7. Do you have any comments on the layout and general design of the facility?
8. Do you think staff needs training (communication) in order to care for people with
dementia? Are there any staff related issues that may impact on care delivery? Nursing,
training, education?

9. How would you decide on a personalized care in relation to the physical and social
environment?

Interviews with managers of 22 nursing homes were therefore conducted to explore design and
housing choices issues for people with dementia. The interviews were tape recorded and lasted
between 30 minutes and an hour. Interviews were then transcribed verbatim and analyzed using
NVivo. Thematic analysis was used to examine the choice of dementia care homes available and
the design issues associated with them. The analysis was carried out in line with guidelines as
outlined by Braun & Clarke (2006). Firstly, the interviews were transcribed from tape recordings into
both electronic and printed forms. The second phase was to familiarize oneself with the data; this
involved reading and re-reading the text. Similarities, differences and contrasts between transcripts
were noted. Thirdly, initial codes were generated. This involved writing in the margins of the texts
and similar codes were assembled together in a process described by Saldaña (2009). Fourthly,
themes were sought and a record of all emergent codes was kept in the NVivo 10 software program
for organizational purposes. In the fifth phase the themes were reviewed; themes that the researchers
felt did not support enough data were discarded, whilst themes that were too broad were subdivided.
Finally, themes were re-arranged to form clusters of organizing themes and global themes. Diagrams
were developed using the same software to summarize the findings of this study and to depict themes
(Figures 2-4).
3. Analysis

In addressing the research question about the housing choices available to people with dementia and the design issues associated with these, this paper focuses on three particular, but interconnected aspects of participants’ experiences of care homes. These are: the level of care required by a resident, the atmosphere of a home and the design quality of a care home (Figure 1).

Figure 1: Core themes associated with housing choices available to people with dementia and care home design issues

Level of care required
Participants stated that residents made the decision to move to a care home for a variety of reasons including a need for extra support, safety concerns, health challenges and an inability to cope at home. It was acknowledged that people moved to care homes out of necessity and that very few people viewed it as a positive lifestyle choice. In many cases the decision to move was reached by social workers, family members or hospital staff. Participants maintained that despite the help of community support teams, residents with dementia came to a stage where they found...
it too challenging to cope at home. Therefore occupants needed the extra support that a care
home afforded them:

“I think...people move here because...they are not able to manage themselves
independently or their relatives are sort of...struggling to cope with their needs. I think a
lot of the time...it’s...the last resort for many people” (Participant K).

Some participants noted that people who had dementia required extra care and care homes
afforded provision of 24 hour support and expertise which they may not receive at home. In
terms of safety, many participants commented that residents can “wander”\(^1\) due to dementia.

THIS IS THE PULL-OUT QUOTE. This is the pull-out quote: IN LIGHT OF THIS, CARE
HOMES WERE VIEWED AS SAFE ENVIRONMENTS BY RESIDENTS BOTH IN TERMS
OF LAYOUT, DESIGN OF BUILDINGS AND ALSO DUE TO THE PROFESSIONAL CARE
OFFERED BY STAFF. When selecting a residential care home, occupants considered the safety
aspects of the home:

“They then look for...a...safe environment, so that the initial safety will be secured, they
cannot just walk out of the door” (Participant B).

Others believed that the building design was fundamental to maintaining safety in care homes as
residents required an environment protecting them from injury, yet allowing them to feel safe
while maintaining their mobility. The choice of home was based on the individual’s required
level of care for example different residents required various equipment items, many had lived in
a care home before while others had not and others had multiple impairments. Various occupants

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\(^1\) “Wandering (or exploring) is a term that refers to a type of persistent walking behaviour that may occur as a result of dementia. It may appear to be aimless but the person with dementia may be walking with a purpose.”
had different levels of dementia and many participants commented that residents elected to live in homes with individual or personalized care plans:

“We offer person-centered care by meeting the needs of individual residents based on their life history and the information we gather about them” (Participant U).

Care plans were developed through consultation with family members, doctors or friends. Plans were sometimes altered and reassessed according to occupants’ changing needs. Some participants stated that the care homes in which they worked had rooms of varying sizes and décor to suit a diverse range of residents. Applicant’s background as well as mental and physical needs are assessed before making an offer to them. The choice of home was also based on selection criteria for example care homes had exclusion and inclusion criteria that were based on the level of care required by the future occupant. Participants said that residents checked for specific facilities provided, for instance physiotherapy rooms, when selecting a home. They also considered the level of communication between residents and care home staff:

“We take the lead from them, listen to them and address their comments. They scrutinize the person-care plan. If they feel that there is something missing generally in our care plan, we address and report back to them” (Participant N).

However, most participants did not produce audits in the workplace. An inhabitants’ background influenced their selection for instance if a home related to their birthplace or met with their individual taste. Care workers tried to get a history of the occupant’s previous lifestyle and relate it to their new environment. If someone was interested in gardening then they chose homes with a garden and staff encouraged them to participate in activities in the garden.
Leaving design considerations aside, participants asserted that staffing influenced future occupants’ choice of care home. They believed that working in a care home was a vocation and that staff should be sympathetic and caring towards residents. They required an understanding of the effects of dementia: “you can’t train somebody to love and care” (Participant D). Participants discussed the importance of a balanced staff to occupant ratio for safety of residents. Existing homes had staff to resident ratios of 1:3 or 1:5. Experience and training received by staff were also important considerations. Many participants were involved in internal and external training: This also incorporated learning about communication to improve the level of care in a home. Participants noted that residents had the opportunity to choose homes where National Vocational Qualification (NVQ) training and Continuing Professional Development (CPD) training took place. One participant had put a personalized training scheme in place that was adapted to meet resident’s needs. There was an overriding requirement for suitable staff to meet the care needs of occupants:

“What is the use of adapted buildings if you have not got the staff to look after dementia residents? You must treat them and have a passion for the dementia” (Participant F).

Participants stated that the choice of homes was based on both the building design and the quality of staff available. A well-designed building was ineffective alone without appropriate staffing. Participants reported that residents sometimes moved to more specialized homes as their dementia symptoms increased and some homes catered for some or all stages of dementia. In line with this, one participant changed the registration of their care home to meet dementia needs. Other participants mentioned homes that employed dementia strategies for occupants to choose from and many used diary sheets to keep track of a resident’s needs. However, another
participant felt that there was little choice for couples who wished to live together in a care home: 

“New homes are built to have just one person in a room. So what happens when you get a married couple...You haven’t even got a choice” (Participant P).

All of these factors impacted upon future residents’ choice of care homes yet it appeared from interview analysis that a variety of choice was available for future tenants, however in many cases, their selection depended on the level of care they required and their individual preferences.

Figure 2 below summarizes the subthemes associated with level of care required.
Figure 2: Bubble Diagram depicting level of care required
Atmosphere

A common issue facing housing choice was the atmosphere perceived by residents in care homes. PARTICIPANTS STATED THAT OCCUPANTS WISHED TO LIVE IN HOMELY ENVIRONMENTS. IT WAS IMPORTANT THAT DESIGNERS ENSURED THAT CARE HOMES ARE PERSONALIZED TO HELP THEM TO ‘FEEL AT HOME’:

"From a comfort point of view, it has to feel and be like a home where older people feel familiar with" (Participant A).

Participants encouraged family members and residents to bring familiar objects to the home such as flowers, pictures and ornaments and some residents brought their own furniture to enhance the bedroom. They decorated public areas and planted flowers outside to make residents feel welcome. Participants noted that occupants had the choice between purpose built and pre-existing homes. There was a feeling amongst some participants that newer homes had a more clinical feeling than older buildings. When choosing a color scheme, warm colors were selected and there was an attempt to use furniture and fittings that were found in a home environment. There was a sense that the design of a home could have a positive effect on both staff and residents:

"The design does matter for carers and dementia residents. It raises staff morale, because people enjoy coming to work because of the environment is friendly, homely and comfortable. That happiness also affects the residents” (Participant K).

Other participants stated that their care homes had a holiday atmosphere as the bedrooms were decorated similarly to a hotel. Overall the care homes’ staff aimed to avoid clinical decor to maximize residents’ comfort as the design of the built environment could reduce the stress
experienced by people residents with dementia. Participants aimed to provide relaxation and happiness to residents. One participant believed that care homes should offer residents the opportunity to choose their own bedroom. Bedrooms were nonetheless laid out to suit the individual. Some occupants felt more comfortable in smaller bedrooms yet others preferred larger bedrooms or did not spend much time there. Participants contended that residents chose homes in areas that were familiar to them: “staying in an area that they are familiar with so that care assistants can help them when going to shops” (Participant T). Participants felt that good aesthetics encouraged future residents to choose particular homes as their first impression related to homes decor which acted as a marketing tool. The decor in one home mirrored the culture of the residents:

“We have assorted appliances like African bathrooms, London bathrooms and French bathrooms that bring home memories to residents” (Participant K).

Participants revealed that different areas of the homes had different atmospheres. They facilitated people who liked to withdraw to tranquil, relaxing spaces by providing them with relaxation rooms and quiet sitting areas. They also provided private meeting rooms for families and sensory rooms. This was not the case with all homes but they sought to include these spaces in their layouts. The quiet rooms were in contrast to the lounge and dining areas that were included to encourage interaction between residents. Participants expressed the issues relating to perceived challenging behaviors which may present and the need to ensure this did not affect other occupants. This usually involves them identifying the cause or root of why residents are agitated/anxious/waking up in the middle of the night, and in response to this staff may facilitate something they want to do (go a short walk-related to their past employment, e.g. security guard). It was also noted that residents had the choice of staying in quiet areas or accessing
activities in more public areas. They tried to instil a sense of community by expanding the numbers of lounge areas and organizing group activities such as tea parties, painting, music or games which also helped to prevent loneliness or isolation. Figure 3 below highlights the themes associated with the atmosphere of care homes.

Figure 3: Bubble Diagram depicting atmosphere

Design quality
Aside from the emotional aspects in choosing available housing, participants also discussed design issues associated with them. In terms of design quality key areas highlighted were
wayfinding strategies, maintaining control, space, purpose built homes, lighting, color, and facilities. They also described negative housing choices available. They acknowledged that the design of the built environment had an impact on the behavior of residents as it could either trigger or remove anti-social behavior. Furthermore, it was important to prevent residents from losing their way which was achieved through signage, pictures and the use of color:

“Door signs, photographs, color blinds on the floor and walls to follow, our bathroom doors have door frames painted in red to identify bathrooms, different seat colors, flooring etc.” (Participant J).

Participants used landmarks and images on the walls to help occupants to find their rooms and images used were often personal to the residents. All participants reported the importance of monitoring residents and the layout of a building’s design needed to respond to this. While many participants used locks on doors to control the movement of occupants, it was more appropriate to design layouts where staff were able to monitor residents from their work stations:

“If you have a work station on the ground floor, you will see all the rooms, this would help to reduce the risk to the patients” (Participant F).

One participant stated that there were areas in their home that were difficult to observe: “There are three areas where they can come down without anybody seeing them” (Participant L). Yet other designs enabled staff to observe residents with ease and Participant M stated that their design incorporated a wander path.

Participants determined that space was an important design issue in the choice of care homes and it was necessary to design rooms that accommodated equipment for handling purposes. One participant commented that, although rooms were built to meet the requirements of legislation,
many were too small to accommodate equipment. Large spaces were required to allow residents freedom of movement, yet they would be less likely to get lost in smaller spaces. In some homes bedrooms were extended to incorporate wet rooms and participants were satisfied with the results. However Participant P believed that en-suites were awkward as some residents were confused and thought that the toilet contained drinking water. Many participants wished to improve the corridor spaces in their care homes as they felt that they were often too long, and narrow and residents experienced difficulty when maneuvering in them. Whilst Participant K was satisfied that their home was spacious, they acknowledged that large spaces were confusing at times for dementia residents:

“It is a big building and could be confusing....But I think I am quite happy with the design, its lounge is quite spacious, there is room for people to walk in the large garden, go outside, floor level anytime” (Participant K).

Whilst many of the participants preferred to work in purpose built properties, many of the care homes were converted or adapted to meet residents’ needs. They compared the merits of purpose built properties to older homes:

“It is very difficult for things already built but in new modern buildings everything should be taken into consideration...Purpose built buildings will enable the architect to be more mindful of design requirements” (Participant G).

In the case of existing buildings, some participants were dissatisfied with the original designs and built extensions to improve the homes. There was a sense that purpose built homes were more likely to locate all the accommodation at ground floor level to prevent falls. Nonetheless older homes had a greater variety of room sizes and may have felt more homely.
The use of lighting and color in the home was highlighted and some participants were aware of past studies carried out in these areas. Participants updated existing homes by installing bright lights and using indicative color schemes. For instance, some homes used color palettes where doors were assigned colors according to the function of the room and this helped the residents to identify rooms. Some participants felt that the color of the flooring in their homes should change from patterned carpets to a plain and less confusing surface and others maintained that the choice of colors had an impact upon the behavior of occupants.

This is the pull-out quote. This is the pull-out quote: IN TERMS OF FACILITIES PARTICIPANTS DISCUSSED THE USE OF SENSORY ROOMS AS THERAPY FOR ANXIOUS OR AGITATED RESIDENTS. THEY ALSO FAVORED THE INCORPORATION OF GARDEN SPACES IN CARE HOME DESIGNS AND VIEWED THEM AS ENCLOSED SAFE AREAS WHERE RESIDENTS COULD RELAX. In particular participants endorsed the design of sensory gardens in care homes:

“Sensory gardens are incredible...and provide the residents with access to walk around for about 5 to 10 minutes with something to look at. It’s calming and entertaining”

(Participant H).

Some homes were designed around bright, colorful and safe gardens and Participant U noted that their home included hair dressing, pub and cafe facilities to help residents to feel comfortable. The use of technology was important for another participant in ensuring that residents were safe and they installed sensors to monitor residents who are prone to getting up at night. It was important to ensure that facilities were fully accessible and some participants working in existing homes highlighted the stairs in their facility as a potential hazard. Some participants did not cater for occupants who used large four wheel chairs whereas other participants asserted that the
shower facilities and en-suites were fully accessible in their homes. Furthermore, in some
homes, people with dementia were accommodated on the ground floor and lifts were installed.

Participants described negative aspects of housing choices available and some participants were
forced to use locks to restrict the movement of residents. Designing homes which consider
monitoring would reduce this problem: “But at the moment people are locked in and you tell
them that they can’t leave, it affects their behaviour” (Participant G). Some participants felt that
there was limited availability of dementia accommodation for people under 65 and a need for a
greater number of dementia care homes in the [location hidden for peer review] area. Many of
the care homes were limited in terms of space with narrow corridors and one participant said that
they would like to make their garden more dementia friendly. Participants maintained that many
homes were decorated in a clinical or institutional way. Not all homes had rooms with a variety
of shapes and sizes. Variety was important to cater for a range of needs. It was challenging for
homes to keep up to date with new trends or legislation and to adapt their homes accordingly.

When construction work was taking place, it had the effect of confusing or upsetting some of the
residents. Cost was a concern as smaller care homes sometimes struggled to fund building
projects and also had to compete with consortium homes. It appeared also that smaller homes
were more focused on customer care than profit. Figure 4 below highlights the themes associated
with the design quality of care-homes.
Figure 4: Bubble Diagram depicting design quality
4. Discussion and Conclusion

One of the biggest challenges facing older people’s wish to age in place is the capability of their domestic environment to offer independence, accessibility and social connectivity. This is even more challenging for people with dementia who continue to live at home given the risks of self-harm and getting lost. Hence more imaginative and inclusive forms of collective housing are needed. If this is not achieved in the short term then a substantial number of older people with dementia will be forced to move to nursing homes. For people with dementia a move to a new environment is often a stressful experience that causes shock, withdrawal and anger.

Hence the design of the physical environment is important and can enhance behavioral, cognitive and comfort issues of people with dementia. Adapting home environments is therefore important to support the development of evidence based design solutions. There is no doubt nowadays that the design of the home environment has the potential to contribute to the wellbeing and functionality of people with dementia.

These issues were explored through semi-structured interviews with 22 managers of care homes in [location hidden for peer review] in order to explore design and housing choices issues for people with dementia. Findings suggest that there are three interconnected themes emerging from participants experience of managing a care home where some residents have dementia. These themes are concerned with the level of care required by the resident, the atmosphere of a home and the design quality of the care home. The level of care required was the main reason behind the move to a care home, this includes the need for extra support, health and safety concerns, and inability to cope alone at home. Ultimately the move to a care home is out of necessity and it is not viewed as a positive lifestyle choice. Care homes offer safe and caring
environments where residents can be safe and mobile. Personalized care plans also contribute to a better fit between the person with dementia and the service and environment provided by the care home. Training of carers emerged as an important aspect necessary to meet the care needs of residents.

The atmosphere provided by the care home was another important theme. Residents’ perception of this has to some extent guided the design, refurbishment and use of spaces in care homes. For example the domestic character of the home, the display of familiar objects, accessible gardens, quiet areas, and the use of warm colors.

Design quality of the care home is also an important factor likely to improve the general wellbeing of residents. Wayfinding cues, efficient lighting and color schemes for example are key aspects that can improve the way people with dementia use the physical environment. This can effectively reduce the risk of anti-social behavior and getting lost. Participants acknowledge that space design is an important factor in the choice of a care home. Facilities such as sensory rooms and sensory gardens are key elements of a dementia friendly home or an enabling environment. Some homes needed to be more inclusive in terms of mobility for wheelchair users while others had dangerous stairs. Locating residents with dementia on the ground floor seems a sensible measure to avoid accidents. Additionally, some homes installed sensors to monitor residents movements at night.

**Implications for Practice:**

It emerged thus from this study that a combination of:

- an appropriate level of care,
a good atmosphere, and

design quality within the care home,

are elements that lead to a more enabling environment.

Design on its own will not lead to successful caring environment unless appropriate care is available and a positive therapeutic and domestic looking environment is also available and accessible to people with dementia.