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Green dementia care in accommodation and care settings: a literature review

Abstract

Purpose

This literature review examined the recent evidence relating to green (nature-based) dementia care for people living with dementia in long-term accommodation and care settings (housing for older people that provides both accommodation and care, such as residential care homes, nursing homes and extra care housing schemes). The review formed part of a pilot study exploring interaction with nature for people living with dementia in care homes and extra care housing schemes in the UK. Rather than a comprehensive systematic or critical literature review, the intention was to increase understanding of green dementia care to support the pilot study.

Approach

The review drew together the published and grey literature on the impacts of green (nature-based) dementia care, the barriers and enablers and good practice in provision. People living with dementia in accommodation and care settings are the focus of this review, due to the research study of which the review is part. Evidence relating to the impacts of engaging with nature on people in general, older people and residents in accommodation and care is also briefly examined as it has a bearing on people living with dementia.

Findings

Although interaction with the natural environment may not guarantee sustained wellbeing for all people living with dementia, there is some compelling evidence for a number of health and wellbeing benefits for many. However, there is a clear need for more large-scale rigorous research in this area, particularly with reference to health and wellbeing outcomes for people living with dementia in accommodation and care settings for which the evidence is limited. There is a stronger evidence base on barriers and enablers to accessing nature for people living with dementia in such settings.

Research limitations

This literature review was conducted to support a pilot study exploring green (nature-based) dementia care in care homes and extra care housing schemes in the UK. Consequently, the focus of the review was on green dementia care in accommodation and care settings. The study, and thus the review, also focused on direct contact with nature (whether that occurs outdoors or indoors) rather than indirect contact (e.g. viewing nature in a photograph, on a TV screen or through a window) or simulated nature (e.g. robot pets). Therefore, this is not a full review of all aspects of green dementia care.

Originality/Value

This paper presents an up-to-date review of literature relating to green dementia care in accommodation and care settings. It was successful in increasing understanding to support a pilot study exploring opportunities, benefits, barriers and enablers to interaction with nature

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3 for people living with dementia in care homes and extra care housing schemes in the UK. It
4 demonstrated the impacts, value and accessibility of nature engagement in these settings
5 and identified gaps in the evidence base. This review and subsequent pilot study provide a
6 strong platform from which to conduct future research exploring green dementia care in
7 accommodation and care settings.
8

9
10 Keywords: dementia; green care; extra care; residential care; nature; natural environment;
11 literature review.

12
13 Article classification: literature review.

14 15 **Introduction**

16
17 This paper reports on a review of UK and international literature conducted in 2017 (with
18 final amendments in 2019) as part of a pilot study that explored the opportunities, benefits,
19 barriers and enablers to interaction with nature for people living with dementia in care homes
20 and extra care housing schemes in the UK (Evans *et al.*, 2019). The purpose of the review
21 was to examine recent literature in order to increase understanding of green dementia care
22 to support the subsequent research activities, rather than to conduct a qualitative systematic
23 or critical literature review. Consequently, the focus of this literature review is green
24 dementia care in accommodation and care settings.
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27
28 'Green dementia care' refers to a range of outdoor and indoor activities that aim to promote
29 health and wellbeing through interaction with nature for people living with dementia.
30 Implementing nature-based experiences and activities as an intervention for promoting
31 human health and wellbeing has developed into a wide variety of approaches with a diverse
32 terminology (e.g. horticultural therapy, therapeutic horticulture, ecotherapy, therapeutic
33 gardens, animal assisted therapy, pet therapy) under the broad umbrella of 'green care',
34 although there is a common ethos to use nature to deliver health, wellbeing, social or
35 educational benefits (Hine *et al.*, 2008).
36

37
38 The term 'accommodation and care settings' is used to refer to the various types of housing
39 for older people that provide both accommodation and care, such as residential care homes,
40 nursing homes and extra care housing schemes. Increasing numbers of people with
41 dementia live in care homes, while extra care housing is now widely viewed as an alternative
42 form of accommodation that can provide opportunities for maximising independence (Evans,
43 2009). An estimated 70% of care home residents are living with dementia (Alzheimer
44 Society, 2016). Data for extra care housing is currently only available from individual housing
45 providers. In 2017-18, three providers belonging to the Housing and Dementia Research
46 Consortium (HDRC) in the UK (MHA, Housing 21 and the Extra Care Charitable Trust) found
47 that 14-17% of extra care housing residents are living with dementia and 7-8% have
48 suspected but undiagnosed / undeclared dementia (source: HDRC).
49
50

51
52 During the 1980's and 1990's there was a shift from the biomedical model of dementia care
53 towards psychosocial approaches. In the 1980's, the Kings Fund for England, in response to
54 the disability rights movement and growing discontent with institutionalised care, produced
55 various codes of practice that stressed the rights of people living with dementia to live well
56 (Brooker and Latham, 2016). Kitwood (1997) introduced the term 'person-centred' with
57 reference to people living with dementia and provided a theoretical framework for person-
58 centred dementia care that is supportive of 'personhood' and maximises wellbeing by
59
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2
3 focusing on the lived-in experience of people with dementia. Individualised care planning is
4 now widely used in accommodation and care settings and increasing attention is being paid
5 to culture of care. Care approaches founded in the 1990s, such as the Eden Alternative
6 (Thomas, 1996) and Butterfly Household¹, that make the experience of the residents central
7 are being increasingly used in long-term care settings in the UK. Some care homes have
8 staff dedicated solely to ensuring residents' wellbeing. There is growing interest in the
9 impacts of engaging with nature on the physical, psychological, emotional, social and
10 spiritual health and wellbeing of people living with dementia. The Eden Alternative approach
11 incorporates plants and animals into the daily life of the care environment as a way of putting
12 meaning into people's lives and addressing loneliness and boredom.

13
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15
16 However, many people living with dementia in accommodation and care settings have
17 limited opportunities to connect with the natural world, which means that they can lose
18 confidence to go outdoors (Clarke *et al.*, 2013). This puts them at risk of losing their
19 personal, cognitive, affective and experiential connections with nature (Zelenski and Nisbet,
20 2014) and the benefits engaging with nature may bring to their health and wellbeing (Dean
21 *et al.*, 2018).
22

23 24 **Scope and methods**

25
26 This literature review drew together published and grey literature on: the impacts of
27 interaction with nature on health and wellbeing outcomes (e.g. physical health, emotional
28 health, behavioural issues, social interaction, cognitive function, quality of life, spiritual
29 wellbeing) for people living with dementia; barriers and enablers to provision of nature-based
30 dementia care in accommodation and care settings; established successful approaches for
31 connecting people living with dementia with nature.
32

33
34 The literature review process used a range of academic databases as well as government
35 and third sector web sites and manual searching, including bibliographies and reference lists
36 of included papers and the identification of, and contact with, research centres, individual
37 experts and practitioners in the field. Conference papers, websites and news articles were
38 also important sources of information as were communications with HDRC members and
39 project advisory group members relating to in-house nature intervention strategies among
40 UK housing providers. This review formed part of a pilot study exploring interaction with
41 nature for people living with dementia in care homes and extra care housing schemes in the
42 UK (Evans *et al.*, 2019), thus the review focused mainly on UK literature published from
43 2006 to 2018 but also included international literature written in English where it was thought
44 to add useful viewpoints on the topic.
45
46

47
48 The focus of the study and hence this literature review was on direct contact with nature
49 itself or aspects of the natural environment (whether that occurs outdoors or indoors) rather
50 than indirect contact (e.g. viewing nature in a photograph, in an artistic portrayal, on a TV
51 screen or through a window) or simulated nature (e.g. robot pets or simulated nature). The
52 impact of 'virtual nature' on wellbeing is briefly considered due to its relevance to less
53 ambulant older people living in long term care settings, who may have even less opportunity
54 than other residents to engage directly with the outdoor natural environment.
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58 Any benefits from engaging with nature for people in general and for older people should
59 also apply to those living with dementia. Thus, this paper initially provides brief overviews of
60

1
2
3 the evidence relating to the impacts of engaging with nature on people in general, older
4 people and residents in accommodation and care settings (e.g. extra care housing,
5 residential care homes, care homes with nursing). It then examines evidence relating to
6 people living with dementia.
7
8

9 **Results**

10 *Impacts of the natural environment on people in general*

11 *1. The theory*

12
13
14
15 There are well established theories about our spiritual connection with and dependence on
16 nature. For example, the psychiatrist Carl Jung proposed that the natural world provides us
17 with emotional and spiritual nourishment and described nature as 'the nourishing soil of the
18 soul' (Sabini, 2008). Over 30 years ago, the biologist Edward Osborne Wilson proposed the
19 Biophilia Hypothesis, asserting that human beings have an evolutionary drive to interact with
20 nature that makes it essential to our psychological health (Wilson, 1984). The mechanisms
21 for this are still not fully understood, although there have been theories that try to explain
22 how contact with nature produces this health and wellbeing restoration (e.g. Ulrich *et al.*,
23 1991; Kaplan, 1995). The field of environmental psychology has built up a research base on
24 biophilia, including the seminal work of Stephen and Rachel Kaplan (1989) and of Roger
25 Ulrich (1995). More recently, Kellert (2012) suggested that affiliation with nature has shaped
26 human capacity for thought, healing and health, and that nature performs a crucial role in
27 maintaining physical and mental wellbeing. As Bird (2007) suggested, it makes sense that
28 after 10,000 generations of having to survive in a natural environment, human evolution
29 would have programmed our genes to perform best in the presence of naturally provided
30 water, shelter, food and safety. However, we are no longer in that environment. From an
31 evolutionary perspective, having spent over 95% of our development in natural savannah-
32 like environments (Wilson, 1984), it is only relatively recently that humans have experienced
33 a rapid disconnection from nature and it would be surprising if we did not have some
34 difficulty adapting to this new environment (Bird, 2007).
35
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40 *2. The evidence*

41
42 A large body of established empirical evidence shows that the natural environment is
43 measurably beneficial to both our psychological and physical health and wellbeing. There
44 have been a number of reviews of the evidence for the salutogenic effects, e.g. Bowler *et al.*
45 (2010), Faculty of Public Health (2010), Harlow *et al.* (2010), Marmot (2010), Pretty *et al.*
46 (2011), Russell *et al.* (2013), Keniger *et al.* (2013), Balfour and Allen (2014), Hartig *et al.*
47 (2014), Mensah *et al.* (2016). However, the evidence for the different proposed benefits
48 varies in quantity and quality. There is strong evidence for the benefits of green care in the
49 treatment of people with mental health problems (e.g. Pearson and Craig, 2014; Gascon *et al.*,
50 2015; Bragg and Atkins, 2016) and a wide range of nature-based interventions are used
51 for such treatment, although awareness and promotion of such interventions is poor (Bragg
52 and Leck, 2017). Recently, Soga *et al.* (2017) conducted systematic review then meta-
53 analysis of research examining the effects of gardening, including horticultural therapy, on
54 health. The meta-analysis of 22 case studies published after 2001 showed a significant
55 positive effect of gardening activities on a wide range of physical, mental and emotional
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3 health outcomes, thereby providing strong evidence for the benefits of gardening to public
4 health.

5
6 In Japan, the term 'Forest bathing' (shinrin-yoku) is used to describe the practice of walking,
7 viewing and just simply spending time in a forest atmosphere. Forest bathing has an
8 established evidence base. For example, researchers in Japan have found that forest
9 bathing has greater positive effects on mental and physical health and relaxation than
10 walking in urban environments (e.g. Park et al., 2010; Takayama et al., 2014).

11
12 Benefits to spiritual health and wellbeing have received far less attention than physical,
13 emotional and psychological benefits, despite the potential important consequences of this.
14 This may be due to difficulties with defining what is meant by spiritual health or wellbeing,
15 the fact that it means different things to different people, and the challenges associated with
16 studying such less tangible benefits (Goldsmith, 2012; Keniger *et al.*, 2013).

17
18 In comparison to the vast amount of research on interacting with green spaces, there is
19 relatively little on blue spaces, that is inland, coastal, rural and urban water settings (e.g.
20 Miller et al, 2012; Foley and Kistemann, 2015). Nevertheless, there is growing interest in
21 'blue health' and recent research suggests that the presence of water enhances the health
22 and wellbeing benefits of the natural environment (e.g. White *et al.*, 2016; Natural England,
23 2018).

24
25 Animals are also part of the natural environment and there is a widely held belief that pets
26 are good for us – the so called 'pet effect'. However, reviews of the literature have found
27 mixed evidence for the benefits of pet ownership to human health and wellbeing with largely
28 low quality studies that have numerous methodological limitations (e.g. Wells, 2011; Herzog,
29 2011; Smith, 2012; Kamioka *et al*, 2014). Overall, evidence for the benefits of pet ownership
30 to human health, wellbeing and longevity is inconsistent and inconclusive.

31 32 33 34 35 36 *Impacts of the natural environment on older people*

37
38 Continued access to the outdoor natural environment is important to older people and
39 without it, they run the risk of becoming isolated, lonely, and losing their connection with
40 nature (I'DGO, 2012). Reviews of the evidence relating to the impacts of interaction with
41 nature on the health and wellbeing of older adults have tended to focus on gardens and
42 gardening. Reviewers' conclusions were mixed with some finding little or insufficient
43 evidence for any benefits (e.g. Nicklett et al., 2016) and others finding some evidence, albeit
44 from studies of poor methodological quality (e.g. Wang and MacMillan, 2013; Tournier and
45 Postal, 2014). However, gardening provides physical exercise and exposure to sunlight and
46 there is evidence of physical benefits for older adults as a result (Robson and Troutman-
47 Jordan, 2015; McNair, 2012; De Rui et al., 2014). There is also some promising evidence
48 that, for older adults, gardening reduces depressive symptoms, provides a sense of
49 accomplishment and self-worth and, in the case of green spaces such as allotments,
50 promotes social interaction (Tournier and Postal, 2014; Robson and Troutman-Jordan,
51 2015).

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55
56 There are substantial gaps in the literature, for example, with respect to benefits of pet
57 ownership and animal assisted therapy (Cherniack and Cherniack, 2014) and spiritual
58 benefits to older people.
59

Green care in accommodation and care settings

Green care for older people in accommodation and care settings, such as care homes and extra care housing, can take place outdoors within the garden space (e.g. gardening, horticultural activities or outdoor exercise), outdoors further afield (e.g. visits to arboreta or farms and walking or rambling trips) or indoors (e.g. looking after indoor plants, arts and crafts activities involving or about plants, interacting with pets or visiting animals) (Clarke *et al.*, 2013). Interaction with nature can be passive, that is simply being in or watching nature (e.g. watching nature programmes on TV, sitting in the garden, watching children play outdoors, watching animals or socialising outside) or active (e.g. gardening, arts and crafts, exercise such as walking and Tai Chi, looking after farm animals or taking care of a pet) (Whear *et al.*, 2014; Hendriks *et al.* 2016). Engaging with nature in such settings may also be specifically arranged or organised by staff, volunteers or residents (e.g. walking groups or gardening clubs) or spontaneous (e.g. going out into the garden to get some fresh air or sun) (Bragg and Atkins, 2016).

However, older people living in such settings run the risk of losing their connections with nature. Whether they are used to sitting in their own garden, gardening, tending an allotment, the company of a pet or walking in green spaces, they may lose this activity that connected them to nature when they move into the care setting, unless the setting provides them with similar opportunities. Many care homes and extra care schemes have gardens or outdoor green spaces, but evidence suggests that the majority of these are underused by the residents (e.g. Carroll and Rendell, 2015) and there are several reasons for this (see below). Bird (2007) pointed out the paradox that, as a society, we find it unacceptable to keep wild animals in captivity, yet some older people in long-term care settings can stay indoors with no access to the natural outside world for years.

Compared to the evidence relating to older people in general, there is relatively little relating to older adults living in accommodation and care settings. Reviews of the relevant literature in this area suggest that the evidence comes mainly from preliminary or poorly designed studies or studies that focus on implications for design of the outdoor environment rather than the health and wellbeing of residents (Detweiler *et al.*, 2012; King *et al.*, 2016).

Although this literature review focuses on direct engagement with the natural environment, the impact of 'virtual nature' on wellbeing is relevance to less ambulant older people living in long term care settings, who may have even less opportunity than other residents to engage directly with the outdoor natural environment. Some studies that have found evidence to suggest that 'virtual nature' can have a positive impact on wellbeing (e.g. Joye and Bolderdijk, 2015; Keltner *et al.*, 2017). These tend to be controlled laboratory experiments that have examined people's responses to viewing nature in photographs, short videos or landscape paintings.

Green dementia care

There are numerous means available to people living with dementia to connect with nature in the UK, such as gardens and gardening, horticultural therapy, care of indoor plants, walking in nature, green exercise, animal assisted therapy, green care farms, green holidays and nature-based arts and crafts. Qualitative studies have found that people living with dementia value the natural environment for the opportunities it provides for exercise, pleasure, relaxation, fresh air, enjoying the beauty of nature, interacting with nature, observing wildlife, sensory experiences (sights, sounds and smells), social interaction, recall

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3 and sharing of memories, self-confidence, freedom and independence (Duggan *et al.*, 2008;
4 Olsson *et al.* 2013; Hendriks *et al.* 2016; Mapes *et al.*, 2016). Outdoor activities with a
5 purpose that involve social interaction provide a strong motivation to engage in the outdoor
6 natural environment (Mapes *et al.*, 2016).
7

8 Overall, large-scale reviews of the evidence on health and wellbeing outcomes of engaging
9 with the natural environment for people living with dementia found the evidence base very
10 limited and fragmented and agreed that there is a need for more rigorous research in the
11 area (Gonzalez and Kirkevold, 2014; Whear *et al.*, 2014; Blake and Mitchell, 2016). There is
12 also a lack of consistency in the tools and measures used to assess wellbeing outcomes.
13

14 Research on this topic that focuses specifically on accommodation and care settings is even
15 more limited. Nevertheless, the reviewers found emerging evidence that engaging with the
16 natural environment has beneficial health and wellbeing outcomes for some people living
17 with dementia, which can be summarised as follows:
18
19

- 20 • With respect to behaviour and emotional health, the evidence of reduction in agitation is
21 the most convincing (e.g. Whear *et al.* 2014). There is also evidence that these benefits
22 may be sustained for hours or for the rest of the day (Hall *et al.*, 2018). Longer-term
23 effects are difficult to establish scientifically for people living with dementia due to the
24 fluctuating and progressive nature of the disease.
25
- 26 • The consistency of the findings on the impact of engaging (passively or actively) with
27 sensory gardens, participating in horticultural activities and indoor use of plants on
28 behavioural issues, wellbeing and affect could suggest that such interventions are
29 beneficial to people living with dementia (Gonzalez and Kirkevold, 2014).
30
- 31 • Interaction with nature appears to act as memory trigger for activities enjoyed in the past
32 and, for those living in long-term care settings, a connection with life before moving into
33 such a setting (Cook, 2016; Hall *et al.* 2018; Mapes *et al.*, 2016).
34
- 35 • Being in the natural environment can have a calming, relaxing and restorative effect
36 (Gonzalez and Kirkevold, 2014; Whear *et al.*, 2014; Blake and Mitchell, 2016).
37
- 38 • Engaging in productive green or animal-based activities or, for some, just still being able
39 to go outdoors, can engender a sense of achievement, pride, self-confidence, self-
40 esteem, self-worth, freedom, purpose, empowerment, independence and a confirmation
41 of self (Mapes, 2010; Robertson, 2012; Olsson *et al.*, 2013; Cook, 2016; Blake and
42 Mitchell, 2016). However, the the confirmation of self that can be gained from carrying
43 out nature-based activities can be a negative experience when discovering that some
44 activities are no longer possible to perform (Olsson *et al.*, 2013)
- 45 • Taking part in nature-based activities with other people appears to improve social
46 interaction and communication (Cook, 2016; Blake and Mitchell, 2016; De Boer *et al.*,
47 2017).
48
- 49 • There is some evidence, albeit from small studies with numerous limitations, that the
50 presence of animals can improve behaviour, promote social interaction and trigger
51 positive reminiscence (Cherniack and Cherniack, 2014; Filan and Llewellyn-Jones,
52 2016).
53

54
55 There is a paucity of evidence on the impact of engaging with nature on the cognitive
56 functioning of people living with dementia and on spiritual wellbeing.
57

58 *Green dementia care in accommodation and care settings*
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3 When people living with dementia move into a long-term care setting, they can experience
4 sudden disconnection from nature and loss of associated benefits it may bring to their health
5 and wellbeing. Nevertheless, a range of nature-based interactions with nature are offered in
6 some accommodation and care settings and it is possible for residents living with dementia
7 to enjoy a variety of activities involving the natural environment (e.g. Hendriks et al 2016;
8 Mapes *et al.*, 2016). Research on green dementia care that focuses specifically on
9 accommodation and care settings is extremely limited.

10 11 12 1. Reviews of the literature

13
14 Most of the studies reviewed by Gonzalez and Kirkevold (2014), Whear *et al.*, (2014) and
15 Blake and Mitchell, (2016) actually took place in long-term care settings and the reviewers
16 found they had numerous methodological limitations. Nevertheless, they concluded that
17 there was compelling evidence of some beneficial health and wellbeing outcomes, as
18 summarised in the section above. There is also promising evidence from these reviews that
19 engaging in horticultural activities, in addition to reducing agitation, may result in increased
20 and sustained health and wellbeing for some people living with dementia in accommodation
21 and care settings, such as improved sleep, reduction in incidence of falls and reduction in
22 use of psychotropic drugs. Even simply caring for indoor plants may have health benefits
23 (Lee and Kim, 2008). While such benefits of active engagement with nature may not be the
24 case for all residents living with dementia, it does provide meaningful activity, which is
25 particularly important for long-term care residents (Cook, 2016; Blake and Mitchell, 2016; De
26 Boer *et al.*, 2017). Furthermore, just being in the care setting's garden has been observed to
27 bring pleasure, happiness and relaxation, trigger memories and facilitate social interaction
28 for residents living with dementia. Limitations of the reviewed studies included: lack of a
29 consistent terminology in relation to green care; insufficient detail on interventions; small
30 samples; lack of control groups; care home staff or family members being asked about
31 residents' experiences rather than the residents themselves. All reviewers concluded that
32 more robust research is required.

33 34 35 36 37 2. Case studies

38
39 Case studies of the impact of engaging with the outdoor spaces of accommodation and care
40 settings have shown health and wellbeing benefits for both residents living with dementia
41 and staff (e.g. The Abbeyfield Society, 2016; White *et al.*, 2018; Brewin, 2018). For example,
42 following the introduction of a 'nature-rich' dementia friendly garden to a nursing home in the
43 UK, residents living with mid- to late-stage dementia showed a significant improvement in
44 mood, as measured by carer assessment, after time spent in the garden (White *et al.*, 2018).
45 Furthermore, the extent of the benefit was greater with increasing time spent outdoors, upto
46 a level of 80-90 minutes, beyond which there were no additional benefits.

47
48 Various programmes are underway in the UK to tackle the problem of underuse of the
49 outdoor spaces of accommodation and care settings. For example, the three year Living
50 Through Landscapes project², which began in February 2016, made 30 care home gardens
51 dementia friendly and provided necessary staff training. A range of resources have been
52 created from this project, including videos. The project is being evaluated by the University
53 of Kent. The 'Breath of Fresh Air' programme tackled garden underuse in Abbeyfield Society
54 care homes using a series of staff education and family awareness sessions. A pilot
55 evaluation of the programme identified improvements in several health and wellbeing
56 outcomes for residents living with dementia (The Abbeyfield Society, 2016).
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2
3 The sense of 'self' may diminish and become elusive as dementia progresses and this can
4 be especially applicable to people living with dementia in long-term care settings (Blake and
5 Mitchell, 2016). Recognition of the self is central to the principles of person-centred care
6 (Blake and Mitchell, 2016). Productive nature-based activities, such as growing food or
7 keeping hens, provides meaningful activity, an empowering experience and social interaction
8 that can result in an increased sense of independence, freedom, purpose, empowerment,
9 self-esteem and self-confidence, which can contribute to a sense of self (Robertson, 2012).
10 For example, HenPower³, run by the charity Equal Arts, is a programme that engages
11 residents in hen keeping and other hen related activities. Cook *et al.* (2013) evaluated this
12 programme and found several positive outcomes for the participants, including residents
13 living with dementia, in terms of mental wellbeing, symptoms of depression, improvement in
14 social contact and social interaction and providing participants with a sense of purpose.
15
16 Involving local communities in the nature-based activities at a care setting can result in a
17 reduction in the social isolation of the care setting's residents and the stigma experienced by
18 residents living with dementia (Brewin, 2018). Although conducted at a day centre, a recent
19 study on the impact of participating in a six-week collaborative gardening project on six
20 people living with dementia has relevance to accommodation and care settings (Noone and
21 Jenkins, 2017). Weekly interviews with the participants, who co-designed the group's
22 gardening activities, found that the project enabled the participants to express and re-
23 connect with their sense of identity, selfhood and agency (sense of independence, freedom
24 and control) and fostered the development of new social bonds.

25
26 Information gleaned from the HDRC membership indicated that a number of care homes and
27 extra care settings have initiated their own green care projects, e.g. watching eggs hatch on
28 CCTV, keeping hens, an artificial beach shared with local children and growing and cooking
29 vegetables. However, currently, no research into the benefits of such interventions for
30 residents has been carried out.

36 3. Gaps in the literature

37 In addition to the gaps in the literature identified above, there is a notable lack of evidence
38 relating to people living with dementia in accommodation and care settings with respect to
39 animal assisted therapy and nature-based outings/day trips. Animal assisted therapy is a
40 promising form of complementary intervention for people living with dementia in long-term
41 accommodation and care. However, the existing evidence for use of animal assisted therapy
42 in dementia care is scant (Flynn and Roach, 2014). Research interest in this area of
43 dementia care is increasing and a recent study found an improvement in the measured
44 quality of life of 59 nursing home residents with moderate to severe dementia following a
45 dog-assisted intervention (Kårefjård and Nordgren, 2018).

46
47 The impacts of taking residents living with dementia out of the care setting environment to
48 experience nature further afield is seriously under researched. There is some evidence on
49 the benefits of woodland walks for care home residents (Mapes, 2011; Mapes, 2012).

53 4. Barriers and enablers to engaging with nature

54
55 Ensuring access to the outdoors for people living with dementia is not only a matter of good
56 practice in dementia care but also a matter of human rights and social justice (Argyle *et al.*,
57 2017). Barriers to such access in accommodation and care settings identified in the literature
58 include:

- perception of the garden as a hazard with risk of increased falls and other safety concerns (risk averse care culture);
- staff attitudes and perceptions;
- lack of staff education and awareness;
- social prejudice and stigma;
- limited staff time to accompany residents;
- limited resources;
- weather and lack of weather protection;
- self-perception of being too old;
- lack of confidence;
- poor physical access;
- poor visual access;
- garden design (e.g. poor accessibility and safety, lack of outdoor resting places, lack of cueing features or landmarks);
- a care culture that is not person-centred.

(Bossen, 2010; Clarke *et al.*, 2013; Gonzalez and Kirkevold, 2014; Whear *et al.*, 2014; The Abbeyfield Society, 2016; Blake and Mitchell, 2016; Mapes *et al.*, 2016)

Key enablers to garden access and use for residents living with dementia include staff education concerning health and safety risks versus benefits (Detweiler *et al.*, 2008; Gonzalez and Kirkevold, 2014) and designing the indoor and outdoor spaces together so that the outdoor garden space is easy to visually and physically access and is safe for residents to use on their own (Chalfont, 2007). There is evidence that an organisational ethos or culture that promotes residents' independence, has a positive attitude towards the outdoors and is supportive of residents going outdoors can be more critical to the success of the garden than its actual design (Carroll and Rendell, 2015 and 2016; Hendriks *et al.*, 2016). This is an important finding because it means that housing providers do not have to spend vast amounts of money on specially designed gardens, as long as the outside spaces are safe and easy to access for residents wishing to go outdoors on their own.

There are a number of guidelines for designing dementia-friendly gardens (e.g. Chalfont and Walker, 2016; Pollock and Cunningham, 2018). However, still relatively little is known about how people living with dementia respond to specific features of the natural outdoor environment and in what ways, and how planned activities and environmental conditions can encourage engagement and/or benefit residents.

Discussion and conclusion

This paper has presented an up-to-date review of literature relating to green dementia care in accommodation and care settings. Although the focus of the review was on people living with dementia in accommodation and care settings, it was successful in increasing understanding in this area in order to support a pilot study that explored opportunities, benefits, barriers and enablers to interaction with nature for people living with dementia in care homes and extra care housing schemes in the UK (Evans *et al.*, 2019). It has demonstrated the impacts, value and accessibility of nature engagement for people living with dementia in these settings and identified gaps in the evidence base. The goal of the literature review and subsequent pilot study were to provide a platform from which to conduct future large-scale research that explores green dementia care in accommodation and care settings.

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2
3 While there are numerous means available to people living with dementia in accommodation
4 and care settings to connect with nature, the evidence base on the health and wellbeing
5 benefits of such a connection is limited and there are notable gaps in the literature. There is
6 also a lack of consistency in the tools and measures used to assess wellbeing outcomes.

7
8 There is scant evidence on the benefits of blue spaces to health and wellbeing as most of
9 the evidence on the benefits of natural outdoor environments has focused on green spaces.

10
11 There is need for high quality, robust research into the benefits of pet ownership and animal
12 assisted therapy to the health and wellbeing of older adults and people living with dementia
13 generate an evidence base and understand best practice. Evidence on the benefits of
14 engaging with nature to spiritual health and wellbeing is also extremely limited, particularly
15 for people living with dementia, despite the potential important consequences of this. This
16 may be due to difficulties with defining what is meant by spiritual health or wellbeing and the
17 challenges associated with studying such less tangible benefits. More research on the
18 impacts of taking residents living with dementia out to experience nature further afield is
19 needed to form an evidence base that may convince providers of accommodation and care
20 for older people of the health, wellbeing and cost benefits of taking residents with dementia
21 out of the care setting environment into woodland and other outdoor natural environments.

22
23 Nevertheless, while interaction with the natural environment may not guarantee sustained
24 wellbeing for all people living with dementia, there is compelling evidence for several health
25 and wellbeing benefits. There is also evidence that these benefits may be sustained for
26 hours or for the rest of the day. Longer-term effects are difficult to establish scientifically for
27 people living with dementia due to the fluctuating and progressive nature of the disease.

28
29 There is a stronger evidence base on the barriers and enablers to accessing nature for
30 people living with dementia in long-term accommodation and care settings. Staff education
31 and a care culture that supports and promotes residents' independence, has a positive
32 attitude towards the outdoors and is supportive of residents with dementia going outdoors is
33 critical to the success and effective use of the garden for such residents. Design of the
34 outdoor space so that, for residents with dementia, it is easy to visually and physically
35 access and safe to use on their own is also important and is best achieved by considering
36 the outdoor space together with the indoor space during the design of the setting as a whole.

37
38 Rather than incurring the expense of adding a garden as an afterthought, accommodation
39 and care settings may derive greater benefit for the residents living with dementia by finding
40 out about and making use of local programmes and organisations that offer nature-based
41 experiences or activities for people with dementia. Providing access to the outdoors for
42 people living with dementia is not only a matter of good person-centred practice in dementia
43 care, but also central to the promotion of the human rights and social inclusion of people with
44 dementia.

45
46 In terms of opportunities for people living with dementia in accommodation and care settings
47 in the UK to engage with nature, different types of nature-based experiences and activities,
48 both passive and active, that can take place indoors, in the care setting's outdoor space and
49 outdoors further afield have been seen in this review. However, there were few evaluations
50 of nature-based programmes offered in the UK for people living with dementia in
51 accommodation and care settings.

52
53 High quality, large-scale research into the impacts of engaging with the natural environment
54 on the health, wellbeing and quality of life of people living with dementia in accommodation
55 and care settings, and the cost effectiveness of nature-based interventions is long overdue.
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1
2
3 Better understanding of the key health and wellbeing outcomes of engaging with nature for
4 people living with dementia in accommodation and care settings via robust empirical
5 evidence is needed to inform decision-making, care planning and policy relating to green
6 dementia care in such settings. This review and the subsequent pilot study provide a strong
7 platform from which to conduct such research.
8
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