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### **Citation**

Velde-van Buuringen, M. van der, Achterberg, W. P., & Caljouw, M. A. A. (2020). Daily garden use and quality of life in persons with advanced dementia living in a nursing home: a feasibility study. *Nursing Open*, 8(3), 1243-1253. doi:10.1002/nop2.740

Version: Publisher's Version

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**Note:** To cite this publication please use the final published version (if applicable).

# Daily garden use and quality of life in persons with advanced dementia living in a nursing home: A feasibility study

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## Abstract

**Aim:** To evaluate the process of daily going outside in a nursing home garden and explore the effect of garden use on quality of life and neuropsychiatric symptoms in persons with dementia.

**Design:** A feasibility study with quantitative and qualitative approaches.

**Methods:** Twenty residents with a diagnosis of moderate-to-severe dementia participated. The intervention consisted of at least 30 min of garden use, whereby any activity outside is possible as long as it is person-centred and fitting within usual daily nursing home practice. Interviews were held with caregivers, and questionnaires were sent to other disciplines involved. Quality of life (QUALIDEM) and neuropsychiatric symptoms (NPI-NH) were collected at baseline, intervention and postintervention.

**Results:** Caregivers experienced and observed benefits of going outside for themselves, in residents and relatives. Incorporating daily garden use does not imply an additional task, but rather rearranging priorities and doing the usual activities outside a part of the time.

## KEYWORDS

behaviour, dementia, gardens, nursing homes, quality of life

## 1 | INTRODUCTION

Persons with dementia have a high disease burden (Alzheimer Nederland, 2018) and experience a major loss of QoL (Alzheimer Nederland & Vilans, 2013). The definition of dementia-specific QoL is “the multidimensional evaluation of the person-environment system of the individual, in terms of adaptation to the perceived consequences of the dementia” (Ettema, Dröes, et al., 2005). Some of the aspects that influence QoL are behavioural and psychological symptoms of dementia (BPSD), for example agitation (Banerjee et al., 2009; Finkel et al., 1996). BPSD is defined as “signs and symptoms of disturbed perception, thought content, mood and behavior”

(Finkel et al., 1996; Kales et al., 2015). Nearly all persons with dementia will be affected by one or more symptoms during the course of their illness (Kales et al., 2015; Lyketsos et al., 2011). Possible causes of the symptoms are neurobiologically related disease factors, unmet needs such as hunger or pain, caregiver factors and environmental triggers (Kales et al., 2015).

## 2 | BACKGROUND

Behavioural and psychological symptoms of dementia is very complex, and there is no “one-size-fits-all” solution to solve them (Kales

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et al., 2015). However, there is consensus that, in general, non-pharmacological interventions are preferable to pharmacological interventions (Seitz et al., 2012). One of those non-pharmacological interventions is the passive and active use of gardens (Abraham et al., 2017). Design and proper use of the physical environment are increasingly recognized as an important factor in the care of persons with dementia (Day et al., 2000). Current guidelines recommend specific attention to the physical environment, including outside spaces (Zorginstituut Nederland, 2017).

In recent years, attention for the positive effects of experiencing nature, that is the subjective perception and evaluation of natural elements in the environment, is increasing (Hartig et al., 2014). Research has shown that there are direct beneficial effects of nature on stress and indirect beneficial effects on physical activity and social contacts and therefore also on health and well-being, through contact with nature (Hartig et al., 2014). The systematic review of Nicholas et al. (2019) shows evidence of benefits of nature among older adults, particularly in long-term care facilities. Significant improvement was found in QoL, anxiety, depression, social relations, and physical and cognitive abilities. Studies focusing on persons with dementia show a statistically significant decrease in agitation and significantly higher levels of engagement. However, the evidence lacks robustness (Nicholas et al., 2019). Another more specific review about the influence of a natural environment on nursing home residents with dementia also found promising positive results (Whear et al., 2014). The quantitative studies in this review suggested that garden use is associated with decreased levels of agitation. The findings from the qualitative studies revealed some themes around the views and experiences of the garden from the perspective of residents and staff and/or relatives, namely the presence of a garden allowed for relaxation and could also stimulate activity and memories. It also provided a normalizing context for interactions with staff and visitors. Benefits of the garden were thought to occur through reminiscence and sensory stimulation (Whear et al., 2014). However, most of the reviewed studies, both quantitative and qualitative, are of poor quality, due to high risks of bias and no (reporting of) valid data tools and the quality of analysis (Whear et al., 2014). More evidence is needed to understand the mechanisms, barriers and facilitators involved in integrating the option of appropriate garden use in building new nursing homes or rebuilding existing ones and the implementation of garden use in the daily care of persons with dementia.

The objective of this study was to evaluate the process (usefulness, feasibility, applicability) of daily going outside in a nursing home garden and to explore the effect of garden use on QoL and neuropsychiatric symptoms in persons with advanced dementia. The research questions that will be answered are as follows: What is the effect of daily garden use on QoL and neuropsychiatric symptoms in persons with advanced dementia living in a nursing home? And what can be learned from the process of the implementation of this intervention? The results of this study will be used to develop an effect study.

### What does this paper contribute to the wider global clinical community?

- Daily going outside in the garden leads to positive effects on quality of life of persons with dementia living in a nursing home.
- Caregivers experienced and observed the benefits of going outside in residents, their relatives and for themselves.
- Incorporating daily going outside in a nursing home garden needs increase in knowledge, creating awareness and rearranging priorities of caregivers and other disciplines.

## 3 | METHODS

### 3.1 | Setting and study population

The present feasibility study was conducted in a nursing home purposefully selected, because the entire staff was trained in person-centred care and it has a green garden suitable for persons with dementia. Person-centred care is a care approach built around the needs of an individual. It recognizes that all people are unique, with their own personal needs. The task of the caregivers is to be aware of behaviours that undermine the person's well-being (and to do that as little as possible) and enhance the person's well-being (and to do that as much as possible) to deliver optimum levels of care (Kitwood, 1997; Mitchell & Agnelli, 2015).

Residents with a diagnosis of moderate-to-severe dementia (Reisberg Global Deterioration Scale [GDS]  $\geq 5$ ) (Reisberg et al., 1982) were eligible to participate. The legal representatives of all 72 residents living in the participating nursing home were informed of the study via a letter explaining the purpose and procedures of the study. Legal representatives of the residents who objected to participation (opt-out, three residents), or participants who did not meet the inclusion criteria (one resident), were not enrolled in the study. This resulted in a population of 68 eligible residents. Participants were then selected by the researcher as follows: the names of all 68 residents were listed in alphabetical order per ward and then every 3rd, 6th, 9th and 12th resident was picked. In this way, a sample of 24 participants were randomly selected, that is four participants from each of the six wards.

### 3.2 | Design and procedure

The description of the intervention is compliant with the Template for Intervention Description and Replication (TIDieR) checklist (Appendix S1). The study is carried out within the Quality Framework Nursing Home Care (Zorginstituut Nederland, 2017) and article 7 of the Quality, Complaints and Litigation Care Act (WKKGZ) (Dutch

Government, 2019), both legal bases for the quality of nursing home care in the Netherlands, and was therefore exempt from Medical Research Ethics Committee approval.

The study design is presented in Figure 1. The study lasted 8 weeks: the first 2 weeks were the baseline period, between weeks 3–4 the intervention was implemented, weeks 5 and 6 were the intervention period and final measurements were carried out at the end of week 8.

During the baseline period (weeks 1–2), there were no instructions for the caregivers. During the implementation period (weeks 3–4), the researcher helped the caregivers, who were the primary coordinators of the intervention, to start planning the execution of the intervention. They could, for example, contact colleagues in other wards, other disciplines, relatives of the person with dementia and volunteers to make sure that there was someone to go outside in the garden with the participant every day during the intervention period (weeks 5–6). During the follow-up period (weeks 7–8), the wards received no instructions or suggestions. They could return to normal daily nursing home practice, continue with the intervention or something in between.

### 3.3 | Data collection and materials

Data were collected at the end of the 1st, 2nd, 5th, 6th and 8th weeks. In the subsequent weeks, interviews were held with caregivers and questionnaires were sent to other disciplines (psychologist, elderly care physician, occupational therapist, physiotherapist, Registered Nurse [RN], managers) involved in performing the intervention. The interviews focused on the process of and their experiences with the intervention.

### 3.4 | Intervention

Based on the existing literature, we created a new practical, innovative intervention of garden use. The innovation lies in the fact that the care can be given to the residents in the garden instead of inside the nursing home building. Just being outside in the garden can strengthen person-centred care because garden use is beneficial for persons' quality of life and BPSD if it is tailored to

the residents' wishes and preferences (Nicholas et al., 2019; White et al., 2018). The garden-use intervention consisted of going outside for at least 30 min in the nursing home garden, whereby any activity is possible as long as it is person-centred and fits within the usual activities in daily nursing home practice. These 30 min are based on the research of White et al. (2018) who found that improvements in mood were associated with 20 min of being outside, with benefits increasing up to 80–90 min. If more time was spent outside, the beneficial effects decreased (White et al., 2018). Examples of outdoor activities are sitting outside, walking in the garden, talking about the garden, drinking a beverage, having lunch and doing an activity such as reminiscence, a game or gardening.

### 3.5 | Process evaluation

To evaluate the usefulness, feasibility and applicability of the implementation of the intervention, qualitative data were obtained via:

1. notes and memos describing the process of the study during the study period.
2. interviews with caregivers focusing on the usefulness, feasibility, applicability and their experiences. The interviews were conducted by the researcher and took place at the ward using a topic list to structure the interview. Examples of questions are as follows: "What did you like/dislike about the process/going outside with the persons with dementia?", "What would you do differently in the process/going outside with the persons with dementia?" and "How can going outside for at least 30 min every day with the persons with dementia be made feasible?".
3. questionnaires completed by other disciplines involved focusing on the process and experiences. The questionnaires were sent by e-mail with a short instruction. The questionnaires were a short version of the topic list of the interviews.
4. participant diaries where details were recorded during the intervention period (e.g. positive and negative feedback, type of activities, time spent outside).

Usefulness was defined by the degree of how useful this intervention was and what this intervention meant for the daily nursing

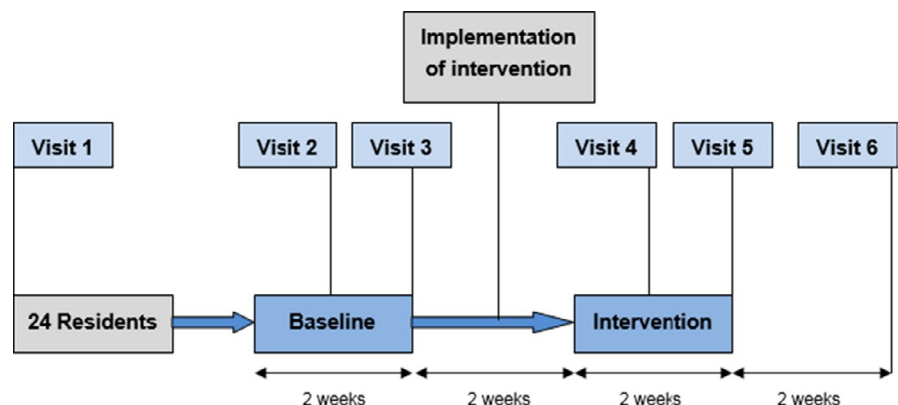


FIGURE 1 Study design

**TABLE 1** Days outside or refused ( $N = 12$ ) in frequencies and percentages per participant, mean days outside and refused per ward, and persons who facilitate the intervention other than the usual professional caregivers

Participant	Ward	Days outside (f)	Days outside (%)	Days refused (f)	Days refused (%)	Persons who facilitate the intervention other than the usual professional caregivers
1	1	4	33.33	0	0.00	Volunteers, UNK
2	1	3	25.00	0	0.00	Volunteers, UNK
3	1	0	0.00	4	33.33	-
4	1	3	25.00	1	8.33	Volunteers, relatives
	M	2.50	20.83	1.25	10.42	
5	2	4	33.33	0	0.00	Relatives
6	2	1	8.33	1	8.33	UNK
7	2	1	8.33	0	0.00	UNK
8	2	0	0.00	1	8.33	-
	M	1.50	12.50	0.50	4.17	
9	3	5	41.67	0	0.00	UNK
10	3	11	91.67	0	0.00	UNK
11	3	5	41.67	0	0.00	UNK
12	3	6	50	0	0.00	UNK
	M	6.75	56.30	0	0.00	
13	4	2	16.67	0	0.00	Relatives
14	4	3	25.00	0	0.00	Relatives
15	4	0	0.00	0	0.00	-
16	4	6	50	0	0.00	Relatives
	M	2.75	22.92	0	0.00	
17	5	1	8.33	3	25.00	UNK
18	5	1	8.33	0	0.00	Relatives
19	5	4	33.33	0	0.00	UNK
20	5	1	8.33	1	8.33	UNK
	M	1.75	14.58	1	8.33	
Total	M	3.05	25.42	0.60	4.58	

Note: Reasons participants refused to go outside were given once: "doesn't like to go outside."

Abbreviation: UNK, unknown.

home practice; feasibility by how feasible this intervention was for the daily nursing home practice and how easy or hard it was to execute the intervention; and applicability by how capable this intervention was to apply in daily nursing home practice.

For analysis of the qualitative data, thematic analysis was applied. The data were coded according to the themes: usefulness; feasibility; and applicability. Within these themes, the data were further examined and coded to identify subthemes.

### 3.6 | Outcome measures

#### 3.6.1 | Quality of life

QoL was measured with the QUALIDEM short version, which includes 18 items that are applicable even to patients with very severe dementia (GDS 7) in six QoL domains (care relationships, positive

affect, negative affect, restless tense behaviour, social relations and social isolation). The caregivers score the items after an observation period of a week. Each item ranges from 0 (never)–3 (often). The scoring is done per domain. A higher score equals higher QoL (Ettema et al., 2007; Ettema, de Lange et al., 2005). The QUALIDEM has satisfactory reliability ( $\rho$  ranging from .60–.90) and validity (Cronbach's alpha ranging from .59–.89) (Bouman et al., 2011; Ettema et al., 2007).

#### 3.6.2 | Neuropsychiatric symptoms

Neuropsychiatric symptoms were measured with the Neuropsychiatric Inventory-Nursing Homes (NPI-NH), which assesses 12 neuropsychiatric symptoms: delusions, hallucinations, agitation/aggression, depression/dysphoria, anxiety, elation/euphoria, apathy/indifference, disinhibition, irritability/lability, aberrant motor behaviour, sleep and night-time behaviour disorders and appetite and eating disorders. It is based on an interview

with the professional caregivers, and in this study, the items are scored after an observation period of one week. The Dutch version of the NPI-NH has high inter-rater agreement, good construct validity and can be scored objectively (Kat et al., 2002; Zuidema et al., 2007). Symptoms are each rated with frequency and severity scores. Frequency ranges from 1 (sometimes)–4 (very often), and severity ranges from 1 (mild)–3 (severe). Each symptom is scored by frequency\*severity scores. Summing up these 10 scores (sleep and night-time behaviour disorders and appetite and eating disorders are not included) will create a total score, ranging from 0 (no symptoms at all)–120 (all symptoms at every moment) (Cummings et al., 1994). In addition, based on the study of Selbaek and Engedal (2012), eight of the domains were clustered into three factors, namely psychosis (delusions, hallucinations), agitation (agitation/aggression, disinhibition, irritability/lability) and affective symptoms (depression/dysphoria, anxiety).

### 3.6.3 | Additional measurements

The following additional measurements were done to describe the characteristics of the participants. Information on number of falls, use of psychotropics and type of outdoor activities was reported in daily nursing records and collected during each study visit. Information on sociodemographic characteristics of participants (age, gender, dementia severity and type of dementia) was obtained at baseline. Dementia severity was assessed with the Reisberg Global Deterioration Scale (GDS). The GDS is an assessment tool that rates stages of cognitive decline, with scores from 1 (no cognitive decline)–7 (very severe cognitive decline) (Reisberg et al., 1982).

## 3.7 | Statistical analysis

Descriptive statistics include the mean and standard deviation when variables were normally distributed and the median and interquartile range for non-normally distributed variables. The total possible days outside ( $N = 12$ ) divided by the actual days going outside or refused to go outside were given in percentages. Differences between baseline and intervention and between intervention and follow-up were analysed using the *t* test for normally distributed variables and the Wilcoxon signed-rank test for non-normally distributed variables. Paired-samples *t* tests were conducted to evaluate the impact of the intervention on quality of life and neuropsychiatric symptoms. A *p*-value  $< .05$  was considered statistically significant.

All analyses were performed with SPSS statistical software, version 23, 2015 (SPSS Inc, IBM, Chicago, IL).

## 4 | RESULTS

### 4.1 | Process evaluation

Table 1 shows an overview of the number of days and percentages the participants went in the garden during the intervention period

and who accompanied them. There were some differences between the wards; the lowest rate of being outside was 12.5%, and the highest, 56.3%. The average of all wards was 25.4%. The participants went outside with the caregivers, recreational therapists, relatives and volunteers. Unfortunately, it was often not recorded who facilitated the intervention, although the researcher was told that it was mostly relatives.

#### 4.1.1 | Usefulness

Participation in this study led to an increase in knowledge about the positive effects of being outside in general and on persons with dementia in particular and created awareness of how often residents actually go in the garden:

It was good to take a moment and be aware of (the frequency of) going outside with the residents and this awareness generated an increased effort to actually go outside, instead of only opening the doors. It brought attention to the importance of going outside and the potential opportunities to go outside, even in bad weather. (caregiver)

In addition, the caregivers realized that in the approach of person-centred care, it is not necessary to do major activities outside and that being a coordinator empowered the caregivers:

It was good to be aware that you don't have to do major activities. Small activities, fitting within the daily nursing home practice, like having a beverage, was also part of going outside. (caregiver)

It 'forced' some of the older caregivers, who are used to working in a specific way, to be more flexible and open to new ideas and possibilities. (caregiver)

Caregivers experienced and observed the benefits of going outside for themselves, in the residents and relatives, for themselves for example by feeling more relaxed, having better communication and a better relationship with the person with dementia. The intervention was observed to be positive for the persons with dementia through improved reminiscence, less agitated behaviour, a new positive habit and being more awake during the day. And the relatives show the benefits for example by giving positive feedback about writing in the diary:

It was nice and relaxing to be outside while working. It felt less rushed and it felt more pleasant, a feeling of having more time. The fresh air was nice. It was easier to communicate with the residents. It was easier to take the time during a conversation and give the residents time to think and wait for the answer. I enjoyed

the residents who enjoyed themselves while being outside. (caregiver)

I was getting to know the residents in a different way. The residents talked more easily and did activities more easily. They seemed to remember more of the past and talked about their memories. (caregiver)

One time, going outside was used as an intervention. A resident showed a high level of agitation and nothing seemed to help her. After being outside in the garden with a caregiver for only 30 min, this resident showed a completely different mood. She was relaxed and even willing to accept some physical care to her feet. (caregiver)

Writing in the diary was a positive experience for some relatives, as if they could get something off their chest. Relatives thought it was important that the residents go outside. (caregiver)

It was considered positive that the residents had a different, more peaceful environment in the garden:

There are fewer people and the people who are outside, are at a greater distance. The garden also provided other, more multisensory stimuli and fresh air, than the inside environment. There are more little things to see, like for example a butterfly, which can start a conversation. Or they know about certain things in the garden and they can share this knowledge. The (warmth of the) sun is very important and calming for the residents. (caregiver)

#### 4.1.2 | Feasibility

The caregivers were ambivalent about the feasibility of the intervention. Some said it was feasible:

It didn't take more time to go outside, because all wards had safe gardens or balconies adjacent to the living rooms. Instead of bringing someone to the table in the living room, we could bring the residents outside to the table, or onto the balconies. We had positive experiences with relatives and had few difficulties with planning the intervention. (caregiver)

Others experienced it as an additional task:

There were often only one or two caregivers in each ward that did all the work. We had a hard time convincing other caregivers to be actively engaged with

the study. These caregivers were less flexible accepting a different perspective on the process of caring. The going outside was seen as an additional task, instead of rearranging priorities and doing the usual work outside part of the time. We were also disappointed that few relatives tried to actively carry out the intervention. For example, relatives didn't want to commit to certain days to go outside with their relative. So it was difficult to plan the intervention weeks. (caregiver)

In general, understaffing and a heavy workload made performing the intervention and going outside a challenge. Communication between researcher and caregivers and between caregivers was difficult due to miscommunication and lack of time or motivation on the part of the caregivers. There was also the daily administrative work that is mostly done on the computer, that is indoors. That makes the caregivers less flexible in the daily process to go outside.

For some caregivers outside represented more danger than inside, for example when a resident frequently forgets to walk with the rollator, or to be aware of slippery stones, or eats flowers:

There has to be some kind of supervision, but that can also be done from inside the ward, regularly looking outside. (caregiver)

#### 4.1.3 | Applicability

Although it was certainly important that the caregivers and other disciplines in this study were trained in person-centred care and that the nursing home had a green garden suitable for persons with dementia, it turned out that the success of the intervention was determined by more factors. The first goal should be to generate motivation and expertise in all involved caregivers, disciplines, management, relatives and volunteers. When the whole team is willing to participate, the start of implementation of the intervention can be planned:

Going outside is not just an activity, but a major process of increasing awareness and acceptance that going outside is just as much an obligation for the caregivers (and other disciplines) as good care of wounds is and that process takes time. (Psychologist)

Another very important factor that affects the implementation of the intervention is a close collaboration between the team manager, psychologist and nurses involved. The implementation period, as well as the intervention period, also needed more elaboration than originally planned. The caregivers needed more time and support to answer the question what could be done differently—with the same resources—to create the opportunity to go outside on a daily basis (e.g. drinking coffee in the garden instead of in the living room):

We need more time to communicate with each other, contact relatives and plan the intervention period. (caregiver)

We want more support from other disciplines, management and the researcher. (caregiver)

Specific agreements should be made and the team manager has to ensure that the agreements are met. (caregiver)

## 4.2 | Outcome measures

### 4.2.1 | Study population

One ward was unable to execute the various parts of the study due to understaffing and heavy workload, so 4 of the 24 selected participants could not participate, resulting in a final study population of 20 participants for evaluation in this study. Of the 20 included participants, 16 were female and the mean age was 85.2 years (standard deviation [SD]: 4.92 years). See Table 2 for the baseline characteristics of the participants.

### 4.2.2 | Quality of life

The mean scores of the QUALIDEM domains at baseline, intervention and follow-up are presented in Table 3. The domain positive affect showed a statistically significant increase between baseline and intervention period: mean 7.80 (SD 2.08) and mean 8.90 (SD 1.78), respectively,  $p = .002$ . This means an increase in positive affect of 1.10 points (95% confidence interval [CI]: 0.46–1.74). In the social isolation domain, a statistically significant positive effect was found between baseline and intervention period, mean 5.73 (SD 1.45) and mean 6.38 (SD 1.60), respectively,  $p = .047$ . This is an increase of 0.65 points (95% confidence interval [CI]: 0.01–1.29). In the domain negative affect, a statistically significant positive effect was found between the intervention and follow-up period, mean 3.70 (SD 1.57) and mean 4.17 (SD 1.75), respectively,  $p = .032$ . This is an increase of 0.63 points (95% confidence interval [CI]: 0.06–1.19). No significant differences were found for the domains care relationship, restless tense behaviour and social relations.

### 4.2.3 | Neuropsychiatric symptoms

For the participants' total and cluster scores of the NPI-NH, we found no significant differences between baseline, intervention and follow-up (see Table 3).

**TABLE 2** Baseline characteristics of the study population ( $N = 20$ )

	N	%
Female	13	65
Mean age (SD)	85.2	(4.9)
Global Deterioration Scale (GDS)		
5 = Moderate dementia	10	50
6 = Moderately severe dementia	7	35
7 = Severe dementia	3	15
Type of dementia		
Alzheimer's disease	7	35
Vascular dementia	5	25
Mixed dementia (AD/VD)	3	15
Not otherwise specified	5	25
Use of psychotropic medication total		
Hypnotics (benzodiazepines)	9	60
Antidepressants	7	
Antipsychotics	3	
Anti-dementia medication	1	

Abbreviations: SD, standard deviation; AD, Alzheimer's disease; VD, vascular dementia.

### 4.2.4 | Type of activities

The frequency of activities as described in the diaries is presented in Table 4, with the most frequently carried out activities are at the top of the table. Various activities could be done at the same time (e.g. sitting and having a beverage) but are presented separately. Most activities were usual activities in daily nursing home practice, such as sitting (21 times), walking (15 times) and having a beverage (12 times). There were a few planned activities (e.g. going to the beach), which were planned before the start of the study by recreational therapists.

## 5 | DISCUSSION

### 5.1 | Process evaluation

#### 5.1.1 | Usefulness

Participation in this study led to an increase in caregivers' knowledge about the positive effects of being outside in general and on persons with dementia in particular and created awareness of the frequency of residents actually going outside. Caregivers experienced and observed the benefits of going outside for themselves, in the residents and relatives. It was considered positive that the residents had a different, more peaceful environment in the garden.



	Baseline		Intervention		<i>p</i>	Follow-up ( <i>n</i> = 12)		
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		<i>M</i>	<i>SD</i>	<i>p</i>
NPI-NH total (0–120)	9.10	8.45	8.88	6.65	.913	7.75 <sup>a</sup>	7.88	.168
Psychosis (0–24)	0.68 <sup>a</sup>	1.23	0.95 <sup>a</sup>	2.82	1.00	1.00 <sup>a</sup>	1.85	.655
Agitation (0–48)	4.33	4.59	4.03 <sup>a</sup>	4.60	.900	3.00	4.24	.307
Affective symptoms (0–24)	2.50 <sup>a</sup>	3.42	2.15 <sup>a</sup>	2.81	.669	1.50 <sup>a</sup>	2.98	.273
QUALIDEM								
Care relationship (0–9)	6.43	2.15	6.80 <sup>a</sup>	1.74	.288	6.92 <sup>a</sup>	1.98	.572
Positive affect (0–12)	7.80	2.08	8.90	1.78	.002 <sup>**</sup>	9.33 <sup>a</sup>	3.08	.384
Negative affect (0–6)	3.90	1.41	3.70	1.57	.460	4.17	1.75	.032 <sup>*</sup>
Restless tense behaviour (0–9)	6.15	2.22	5.65	2.02	.391	6.83 <sup>a</sup>	2.37	.057
Social relations (0–9)	6.35	1.91	6.85	1.44	.212	7.50	1.51	.740
Social isolation (0–9)	5.73	1.45	6.38	1.60	.047 <sup>*</sup>	7.00	1.65	.806
Number of falls	4		2			0		

Note: All falls happened inside the nursing home building.

<sup>a</sup>Distribution of scores was not normal, but for reasons of readability only means and standard deviations are shown.

\**p* < .05;

\*\**p* < .01.

### 5.1.2 | Feasibility

The caregivers were ambivalent about the feasibility of the intervention. Some said it was feasible, and others experienced it as an additional task. In general, understaffing and heavy workload presented a challenge. Communication between researcher and caregivers and between caregivers themselves was difficult due to miscommunication and lack of time or motivation of the caregivers. There was also the daily administrative work, that is mostly done on the computer, that is inside, that makes the caregivers less flexible in the daily process to go outside.

### 5.1.3 | Applicability

Besides person-centred care and a green garden suitable for persons with dementia, other important factors that influenced the implementation of the intervention were the duration and elaboration of each period of the intervention. There simply was not

enough time and therefore opportunity to implement the intervention sufficiently. Also, the degree of collaboration with the involved team manager, psychologist and nurses was an important factor.

## 5.2 | Outcome measures

This feasibility study shows that some domains of QoL improved between the period of normal daily nursing home practice and the period of going outside in the garden. The participants showed an increase in positive affect and a decrease in social isolation during the intervention period. This indicates that incorporating going outside in a garden daily in everyday nursing home practice can have a beneficial effect on the QoL of persons with advanced dementia.

Also, the participants showed a decrease in negative affect during the follow-up period where no instructions were given. This may be a delayed positive effect of the intervention, or a positive effect of the follow-up period. As it is unclear how the follow-up

**TABLE 3** Results of NPI-NH, QUALIDEM and falls at baseline, intervention and follow-up period (*N* = 20)

**TABLE 4** Frequency of activities as described in the diaries

Activity	Frequency
Sitting (often in the sun or shade)	21
Walking (mostly sitting in wheelchairs or using rollator)	15
Having a beverage (coffee, tea, ice cream, fruit)	12
Planned activities ("garden group," "going to the beach," "the greenhouse")	10
Playing games (table shuffleboard, Rummikub)	7
Talking (about the environment, i.e. the kitchen garden, animals, flowers)	6
Looking at the environment (kitchen garden, animals, flowers)	5
Being outside not otherwise specified	5
Singing	2
Listening to music	2
Feeding the animals	1
ADL (cutting nails)	1

Abbreviations: ADL, activities of daily living.

period was executed by the wards, it is not possible to draw any conclusions about this outcome.

Furthermore, our study showed that most activities were usual activities in daily nursing home practice, such as sitting, walking and having a beverage. This indicates that incorporating going outside in a nursing home garden does not have to involve doing an additional task but is about rearranging priorities and doing the usual work outside for a proportion of the time.

Although it is difficult to make meaningful comparisons to other studies due to different interventions and outcome measures, our findings do generally support previous studies, which found positive effects of garden use in persons with dementia. For example, a pilot study by Goto et al. (2014) where the participants were exposed to either a garden or Snoezelen room during a period of time showed positive behavioural changes in the garden-viewing group, whereas the response of the participants in the Snoezelen group was more negative. During the 15 min in the garden, the participants' mean pulse rate was significantly less than in their residential room, whereas little or no change was detected in the Snoezelen room (Goto et al., 2014). In the 1-year study by Connel et al. (2007), participants participated in either an outdoor or indoor activity programme, both with a horticultural focus. The outdoor activity group experienced significant improvements in maximum sleep duration and in verbal agitation.

### 5.3 | Strengths and limitations

One of the strengths of this study is the use of outcome measures specifically designed for persons with dementia. In addition, the fact that it was a feasibility study enabled the researcher to be flexible in the execution of the protocol, while enough information was gained in the process to further develop the intervention for more comprehensive studies.

Some limitations should be considered. First, the sample size was small. However, this study shows that daily going outside in a nursing home garden improved some aspects of QoL. Also, these findings

are of value to the limited number of studies investigating the effect of going outside on QoL of persons with dementia.

Second, the intervention was done during the summer holiday season. Although the weather was perfect for going outside, many of the caregivers were on vacation. This understaffing caused extra stress for the remaining caregivers and increased their workload.

Third, no measurements were done on the number of days the participants went outside during the baseline period. Although the caregivers said in the interviews that the participants were outside more than usual, the exact difference in percentages of being in the garden during baseline and intervention period is not known.

### 5.4 | Implications for practice

In future research, each period in the study should be more elaborate and fit within the normal structures of the organization and wards. For example, the researcher can join existing work meetings to spread information, guide and collaborate with the caregivers, but also the other disciplines. Good implementation makes it possible to embed going outside in daily nursing home practice. By joining existing routines, rearranging priorities and doing some of the regular work outside, the workload that comes with participating in the study for the caregivers will increase very little.

## 6 | CONCLUSION

The present feasibility study shows that incorporating daily garden use does not have to involve doing an additional task but can be realized by rearranging priorities and doing the usual work outside part of the time. It leads to increased positive affect and less social isolation in persons with dementia. However, going outside is not just an activity, it is a major process of becoming aware and accepting that going outside is an obligation for the caregivers (and other

disciplines) just as much as good care of wounds and this process takes time.

## 7 | RELEVANCE TO CLINICAL PRACTICE

This study contributes to the current knowledge of the mechanisms, barriers and facilitators involved in the implementation of garden use in the daily care of persons with dementia and should inform decisions about daily nursing home practice.


### ACKNOWLEDGEMENTS

This research did not receive any specific grant from funding agencies in the public, commercial or not-for-profit sectors.

### DATA AVAILABILITY STATEMENT

Data made available to all interested researchers upon request via the last author.

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#### SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section.

**How to cite this article:** van der Velde-van Buuringen M, Achterberg WP, Caljouw MAA. Daily garden use and quality of life in persons with advanced dementia living in a nursing home: A feasibility study. *Nurs Open*. 2021;8:1243–1253. <https://doi.org/10.1002/nop2.740>