

Comparing day care at green care farms and at regular day care facilities with regard to their effects on functional performance of community-dwelling older people with dementia

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Abstract

Day care at green care farms (GCFs) is a new care modality for community-dwelling older people with dementia. In view of the more physical and normal daily life activities available at GCFs than at RDCFs, we investigated whether functional decline differed between subjects from both day care settings. In this observational cohort study, primary caregivers of 47 subjects from GCFs and 41 subjects from RDCFs rated the subjects' functional performance three times during one year. They also provided information on the subjects' diseases and medication use. Generally, no significant change over time in functional performance, the number of diseases and the number

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of medications was observed, and no differences in these rates of change were found between subjects from both day care settings. This study suggests that GCFs are not more effective in maintaining functional performance or slowing down its decline in community-dwelling older people with dementia than RDCFs.

Keywords

functional performance, green care farms, older people with dementia, regular day care facilities

Introduction

Western societies are ageing (US Census Bureau, 2008). Consequently, the number of dementia sufferers will increase dramatically in the next 50 years (Health Council of the Netherlands, 2002). One of the domains affected by dementia is the patient's functional performance (Haley & Pardo, 1989; Mohs, Schmeidler & Aryan, 2000). The associated morbidity, declining nutritional status, risk of fall incidents and decreased well-being may cause disability, earlier institutionalization and death (Fried, Ferrucci, Darer, Williamson & Anderson, 2004; Fried et al., 2001; Laukkanen, Leskinen, Kauppinen, Sakari-Rantala & Heikkinen, 2000).

Functional decline is commonly determined by assessing performance in basic activities of daily living (BADLs) and instrumental activities of daily living (IADLs). BADLs are basic, biologically necessary activities including feeding, toileting, ambulation and dressing. IADLs are more complex, cognitively demanding, activities including preparing meals, managing money and grocery shopping (Mohs et al., 2000). Longitudinal data indicate that disability in IADL performance develops early in the dementia process, and progresses during the course of the disease. Disability in BADL performance appears and progresses much later in dementia. As recovery from disability is uncertain and often short-lasting in this population (Haley & Pardo, 1989; Mohs et al., 2000), preventing or slowing down functional decline is of importance.

Growing evidence suggests regular physical activity (e.g. walking, household activities or exercise training) to maintain or improve functional performance of frail older people (Eggermont & Scherder, 2006; Landi et al., 2007; Netz, Axelrad & Argov, 2007; Shimada et al., 2010). Adult day care facilities for community-dwelling older people with dementia often offer physical activities, exercise or rehabilitation programmes (Cohen-Mansfield, Lipson, Brenneman & Pawlson, 2001; Jarrott, Zarit, Berg & Johansson, 1998), but so far, researchers were unable to show their effectiveness for functional performance (Baumgarten, Lebel, Laprise, Leclerc & Quinn, 2002; Mossello et al., 2008; Zank & Schacke, 2002).

Since about 10 years ago, a new type of day care facility has been developing in The Netherlands: day care at farms. Similar to regular day care facilities (RDCFs), these green care farms (GCFs) aim to realize a structured and meaningful day programme for community-dwelling frail older people and offer respite care to family caregivers. Recent studies indicate that older people with dementia attending day care at GCFs are physically more active by taking outdoor walks, feeding animals and gardening than their counterparts attending day care at a RDCF. Moreover, they are involved in more normal daily life activities such as dish washing and meal preparation (De Bruin, Oosting, Kuin, et al., 2009; Schols & Van der Schriek-van Meel, 2006).

Since no studies have assessed whether GCFs differ in their effect on functional performance from RDCFs, the aim of the present study was to compare longitudinal change in functional performance in community-dwelling older people with dementia who attend day care at GCFs or at RDCFs.

Methods

Design

This observational cohort study was performed between March 2006 and February 2008. Older people with dementia were recruited from 15 GCFs and 22 RDCFs in The Netherlands. Only GCFs having frail older people as their main target group and offering day care to groups of five to 15 people per day were included in the study. The recruited RDCFs were mostly located in the same region as the GCFs to limit the possible impact of regional differences.

Settings

Green care farms. GCFs are farms that combine agricultural production with care services for people with care needs, including frail older people, mentally disabled people and psychiatric patients. Currently, there are over 900 GCFs in the Netherlands. About 10% of them offer day care for older people with dementia (National Support Centre Agriculture and Care, 2009). GCFs have a relatively home-like character. At GCFs, people can spend the day and, in addition to leisure and recreational activities, take part in normal home-like, farm-related and outdoor activities (De Bruin, Oosting, Kuin, et al., 2009).

GCFs often cooperate with regular health care institutions. Their services are financed by the Dutch national insurance system (Hassink, Zwartbol, Agricola, Elings & Thissen, 2007). Green care farming is not a typically Dutch phenomenon, it is also developing in other European countries including Norway, Italy, Austria and Belgium and the USA (Hassink & Van Dijk, 2006).

Regular day care facilities (RDCF). RDCFs traditionally have a strong care orientation, related to the residential or nursing home environment in which they are often housed. They differ in their main focus which may be either socially or medically oriented. In the Netherlands, socially oriented facilities mainly offer social and (therapeutic) recreational activities and are mostly affiliated to a residential home, whereas medically oriented facilities offer medical treatment, rehabilitation and/or personalized therapeutic programmes and are mostly affiliated to a nursing home (Droës, Meiland, Schmitz & Van Tilburg, 2004b; Jarrott et al., 1998; Leitsch, Zarit, Townsend & Greene, 2001). The RDCFs assessed in the present study are socially oriented.

Subjects

Forty-seven subjects attended day care at GCFs and 41 subjects at RDCFs. For privacy reasons, contact persons at the participating GCFs and RDCFs, instead of the researchers, enrolled subjects and their primary caregivers in this study. Inclusion criteria were: 1. approval to attend day care, provided by the Central Indication Committee for Care (CICC) assessing eligibility for day care; 2. dementia syndrome, according to the report of

CICC; 3. age ≥ 65 years; 4. living at home; 5. primary caregiver willing to participate in the study. Exclusion criteria were: 1. (history of) serious psychiatric problems not necessarily related to dementia and 2. participation in other scientific studies.

Three cohorts (A, B and C), were distinguished based on the subjects' length of stay at the day care facility. Cohorts A, B and C were subjects who, at the start of our study, were about to start or had recently started (on average 1.3 months previously) with day care; participated in day care since approximately 6 months previously; and participated in day care since approximately 12 to 24 months previously, respectively. During the course of the study, 40% ($n=35$) of the subjects dropped out, mostly due to institutionalization. Once the subjects dropped out, also their primary caregivers were excluded from the study (Figure 1).

Informed consent was acquired from a primary caregiver of the subjects. The Medical Ethics Committee of Wageningen University approved the study protocol.

Data collection and procedures

Primary caregivers of the subjects were interviewed three times at their homes with six-month intervals (at study entry and at six- and 12-month follow-up). Except for one subject, primary caregivers were family caregivers such as spouses or children. The interviews lasted approximately two hours each and were performed by researchers of Wageningen University, Radboud University Nijmegen and Utrecht University. The researchers were trained by one of the authors (SdB) to standardize the interview procedures. During the interviews also information on other health outcomes (e.g. cognitive functioning, emotional well-being, behavioural symptoms) was collected from the subjects and their primary caregivers. These findings will be reported elsewhere.

Measurements

Information on sex, age, number of months at the day care facility, number of days of day care per week, marital status, primary caregiver and duration of dementia were collected from the primary caregivers with a questionnaire used in the first interview. Duration of dementia was taken as the primary caregivers' estimate of time from onset of noticeable cognitive impairment to the first interview. The subjects' dementia type was retrieved from the report of the CICC. Cognitive functioning of the subjects was assessed by the Mini Mental State Examination (MMSE). Scores on the MMSE range from 0 to 30, with scores less than or equal to 23 suggesting cognitive impairment (Folstein, Folstein & McHugh, 1975).

The subjects' functional performance was rated by the primary caregivers by means of the Barthel Index (BI) (Mahoney & Barthel, 1965) and the Interview for Deterioration in Daily living in Dementia (IDDD) (Teunisse & Derix, 1991). The BI assesses the individual's performance on 11 BADLs. Scores range from total dependence (0) to total independence (100). The IDDD assesses the individual's performance on IADLs and comprises two subscales: the initiative and the required assistance subscale. Scores on the initiative subscale range from 0 to 36, with higher scores referring to more initiative to perform IADLs. Scores on the required assistance subscale range from 0 to 44, with higher scores referring to more required assistance to perform IADLs (Teunisse, 1995).

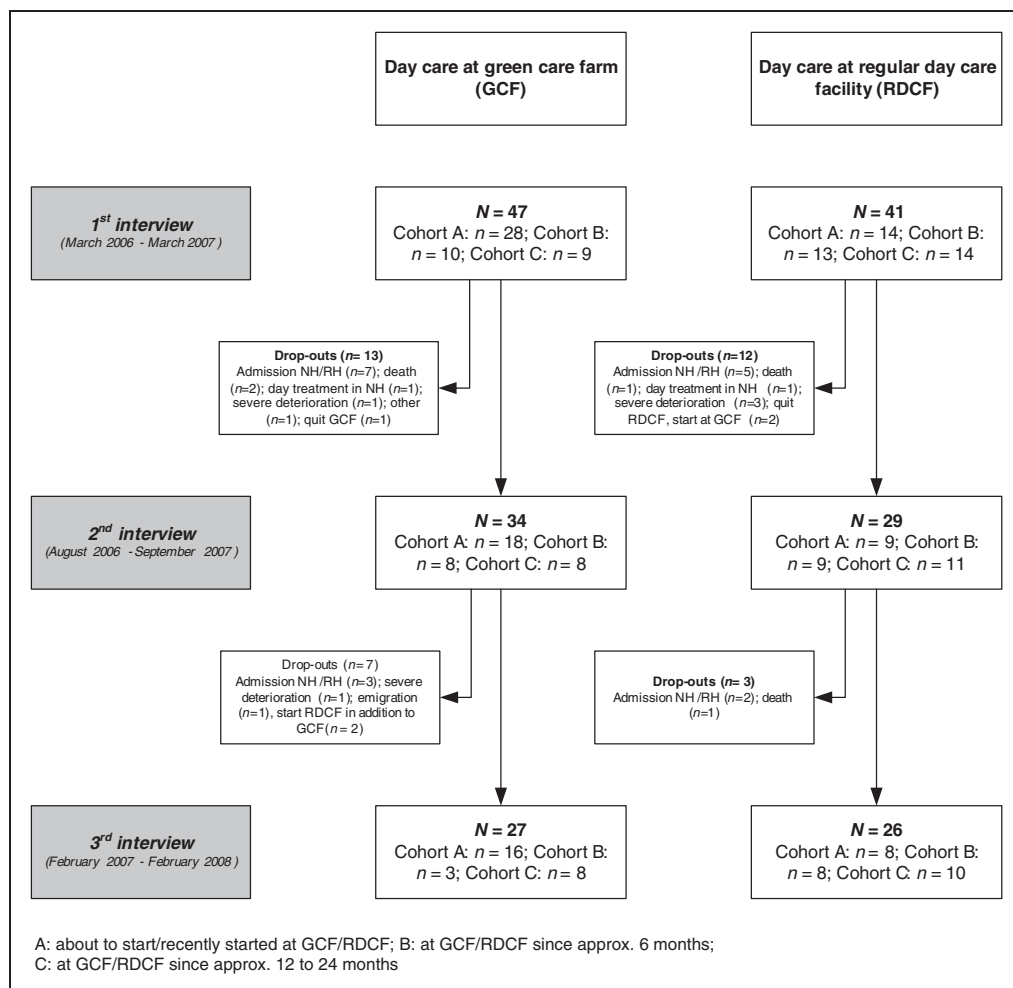


Figure 1. Flow-chart of the course of the study.

Data on co-morbidity and medication use, as related to the functional performance (Boyd, Xue, Simpson, Guralnik & Fried, 2005; Cohen-Mansfield et al., 2001), were also recorded, and collected from the primary caregivers and the reports of the CICC.

Statistical analyses

Differences in characteristics between the GCF and RDCF groups within each cohort were tested by means of Fisher's Exact Test, chi square test for independence and Mann-Whitney *U* test as appropriate.

To explore longitudinal changes in functional performance, number of diseases and number of medications, for each individual who was interviewed three times, a linear

regression model was estimated (Singer & Willett, 2003). The regression coefficient is an indicator for the individual rate of change over time and was rescaled to obtain the individual change per six months. The individual rates of change were considered statistically significant at the $p \leq 0.025$ level to reduce the multiple testing effect. For each GCF and RDCF group within the three cohorts separately, the average rate of change in each of the parameters was determined. As data generally did not meet the assumptions of parametric techniques and the sizes of the GCF and RDCF groups within each of the cohorts were small, the Mann–Whitney U test was used to determine whether rates of change in functional performance, number of diseases and number of medications differed between the GCF and RDCF groups within the three cohorts. Differences were considered significant at $p \leq 0.05$. All analyses were done using SPSS Statistics for Windows, release 17.0, 2008 (Chicago: SPSS Inc.).

Results

General characteristics subjects

Cohort A ('starters'). Table 1 shows that the majority (82%) of subjects at GCFs within cohort A were male, whereas at RDCFs 14% of the subjects were of this gender ($p < 0.001$). The mean age of subjects at GCFs was lower than that at RDCFs (77.7 vs. 83.4 years) ($p = 0.006$), more subjects were married (93% vs. 43%) ($p = 0.001$) and consequently more subjects had a partner as their primary caregiver at home (93% vs. 43%) ($p = 0.001$). Furthermore, the IADL performance in terms of required help was lower in subjects at GCFs than at RDCFs ($p = 0.049$). No significant differences with regard to the other characteristics were observed between the two groups (Table 1).

Cohort B ('day care since six months'). Table 2 shows that all subjects at GCFs within cohort B were married and had a partner as their primary caregiver, whereas more than half of the subjects at the RDCFs were widowed and had (a combination of) others as their primary caregiver ($p = 0.007$ for both comparisons). Further, the estimated time since onset of noticeable cognitive impairment was significantly longer for the GCF group than for the RDCF group ($p = 0.040$). The other characteristics did not differ significantly between the two groups.

Cohort C ('day care since 12–24 months'). There were no statistical differences between the two day care groups within cohort C in any of the general characteristics (Table 3).

Longitudinal change in BADL performance

At the start of the study, the average BADL dependence was small (ranging from 82 to 91) in all cohorts. Tables 4, 5 and 6 show the six-month change in BADL dependence in the subjects within cohort A, B and C respectively. In all but one subject, BADL performance did not change significantly over time. Average rates of change in BADL performance did not differ significantly between the two day care groups within the three cohorts.

Table 1. General characteristics of subjects within cohort A at study entry

	Cohort A		Test statistic	p
	GCF (n = 28)	RDCF (n = 14)		
Sex				
Male	23 (82%)	2 (14%)	–	<0.001
Female	5 (18%)	12 (86%)		
Age	77.7 (± 5.2; 78.6)	83.4 (± 5.8; 84.4)	$Z_{(n = 41)} = -2.7$	0.006
Number of months at day care facility	1.3 (± 1.1; 1.2)	1.2 (± 0.9; 1.4)	$Z_{(n = 42)} = -0.1$	0.894
Days of day care per week	1.8 (± 0.7; 2.0)	2.1 (± 0.9; 2.0)	$Z_{(n = 42)} = -1.3$	0.201
Marital status				
Married/cohabiting	26 (93%)	6 (43%)	–	0.001
Widowed	2 (7%)	8 (57%)		
Primary caregiver				
Partner (+ others)	26 (93%)	6 (43%)	–	0.001
(Combination of) others, not partner	2 (7%)	8 (57%)		
BADL performance (0–100)	90.7 (± 16.2; 95.0)	82.2 (± 19.1; 83.0)	$Z_{(n = 40)} = -1.6$	0.106
IADL performance				
Initiative (0–36)	15.6 (± 7.5; 15.0)	17.8 (± 9.7; 16.0)	$Z_{(n = 40)} = -0.5$	0.623
Required assistance (0–44)	23.7 (± 8.4; 24.0)	20.1 (± 7.8; 20.5)	$Z_{(n = 41)} = -2.0$	0.049
Number of diseases	1.9 (± 1.2; 2.0)	1.6 (± 0.9; 2.0)	$Z_{(n = 42)} = -0.8$	0.412
Medication use				
Total number of medications	4.0 (± 4.0; 2.5)	2.9 (± 2.3; 2.5)	$Z_{(n = 42)} = -1.5$	0.124
Use of psychotropic medications				
Yes	6 (21%)	2 (14%)	–	0.697
No	22 (79%)	12 (86%)		
Number of psychotropic medications	0.4 (± 0.9; 0.0)	0.1 (± 0.4; 0.0)	$Z_{(n = 42)} = -0.6$	0.532
Cognitive functioning (0–30)	19.5 (± 5.6; 21.0)	20.5 (± 5.3; 21.5)	$Z_{(n = 42)} = -0.3$	0.748
Dementia type				
Alzheimer's disease	10 (36%)	5 (36%)	$\chi^2_{(3, 41)} = 2.4$	0.496
Vascular dementia	3 (11%)	1 (7%)		
Other	4 (14%)	0 (0%)		
Cognitive impairment, not specified	11 (39%)	8 (57%)		
Estimated duration of dementia (years)	3.1 (± 1.8; 3.0)	3.6 (± 2.3; 4.0)	$Z_{(n = 31)} = -0.7$	0.469

Data are shown as mean (± SD; median) or as frequency (percentage).

Longitudinal change in IADL performance

At the start of the study, the average IADL performance was moderate in all cohorts. The average initiative scores ranged from 14 to 19 over the three cohorts, and the average required assistance scores ranged from 20 to 25. In all but three subjects, initiative scores did not change significantly over time. Required assistance scores did not change significantly in any of the subjects. Average rates of change in IADL performance did not differ significantly between the two day care groups within the three cohorts (Tables 4–6).

Longitudinal change in number of diseases and medications

At the start of the study, the average number of diseases in the GCF groups within each of the cohorts was approximately two. Most frequent diseases were cardiovascular diseases

Table 2. General characteristics of subjects within cohort B at study entry

	Cohort B			Test statistic	p
	GCF (n = 10)	RDCF (n = 13)			
Sex					
Male	7 (70%)	6 (46%)	–		0.402
Female	3 (30%)	7 (54%)			
Age	75.4 (± 7.5; 76.0)	82.0 (± 7.2; 81.0)	$Z_{(n = 23)} = -1.9$		0.058
Number of months at day care facility	6.8 (± 0.8; 6.7)	6.1 (± 1.5; 5.9)	$Z_{(n = 23)} = -1.2$		0.238
Days of day care per week	2.5 (± 1.3; 2.5)	1.9 (± 0.7; 2.0)	$Z_{(n = 23)} = -1.1$		0.272
Marital status					
Married/cohabiting	10 (100%)	6 (46%)	–		0.007
Widowed	0 (0%)	7 (54%)			
Primary caregiver					
Partner (+ others)	10 (100%)	6 (46%)	–		0.007
(Combination of) others, not partner	0 (0%)	7 (54%)			
BADL performance (0–100)	88.5 (± 17.7; 96.5)	87.9 (± 17.2; 91.0)	$Z_{(n = 23)} = -0.7$		0.492
IADL performance					
Initiative (0–36)	14.7 (± 8.4; 13.0)	18.6 (± 7.9; 22.0)	$Z_{(n = 22)} = -1.1$		0.275
Required assistance (0–44)	24.8 (± 10.5; 23.0)	21.3 (± 9.5; 19.0)	$Z_{(n = 22)} = -0.8$		0.448
Number of diseases	2.2 (± 1.4; 2.5)	2.4 (± 1.4; 2.0)	$Z_{(n = 23)} = -0.3$		0.800
Medication use					
Total number of medications	4.9 (± 3.5; 4.5)	3.9 (± 2.4; 3.0)	$Z_{(n = 23)} = -0.5$		0.589
Use of psychotropic medications					
Yes	3 (30%)	6 (46%)	–		0.669
No	7 (70%)	7 (54%)			
Number of psychotropic medications	0.4 (± 0.7; 0.0)	0.5 (± 0.7; 0.0)	$Z_{(n = 23)} = -0.6$		0.518
Cognitive functioning (0–30)	20.2 (± 7.1; 21.5)	21.4 (± 4.0; 23.0)	$Z_{(n = 23)} = -0.2$		0.803
Dementia type					
Alzheimer's disease	5 (50%)	4 (31%)	$\chi^2_{(3, 23)} = 3.0$		0.385
Vascular dementia	1 (10%)	0 (0%)			
Other	1 (10%)	1 (8%)			
Cognitive impairment, not specified	3 (30%)	8 (62%)			
Estimated duration of dementia (years)	4.7 (± 2.5; 3.5)	2.9 (± 2.0; 2.0)	$Z_{(n = 21)} = -2.1$		0.040

Data are shown as mean (± SD; median) or as frequency (percentage).

such as hypertension and heart failure (present in 60% to 70% of the subjects), diseases of the sense organs including vision and hearing problems (present in 29% to 50% of the subjects), and endocrine diseases such as diabetes and hyperthyroidism (present in approximately 30% of the subjects).

In the RDCF group within cohort A, the average number of diseases was 1.6, whereas this number was approximately 2.5 in the RDCF groups within cohort B and C. Most frequent diseases were cardiovascular diseases (present in circa 43% of the subjects in cohort A, and in circa 70% of the subjects in cohort B and C), musculoskeletal diseases such as rheumatism and hip injuries (present in 40% to 50% of the subjects), and in cohort C in addition diseases of the sense organs (50%) and pulmonary diseases such as COPD and pneumonia (36%).

Average medication use varied from four to five medications in all GCF groups and from three to four medications in all RDCF groups. A minority of the subjects used

Table 3. General characteristics of subjects within cohort C at study entry

	Cohort C			Test statistic	p
	GCF (n = 9)	RDCF (n = 14)			
Sex					
Male	7 (78%)	5 (36%)	–		0.089
Female	2 (22%)	9 (64%)			
Age	79.0 (± 4.6; 78.1)	82.8 (± 6.6; 81.7)	$Z_{(n=23)} = -1.5$		0.137
Number of months at day care facility	18.1 (± 7.0; 15.6)	15.9 (± 6.2; 12.7)	$Z_{(n=23)} = -1.1$		0.284
Days of day care per week	2.7 (± 1.2; 2.0)	2.4 (± 1.0; 2.0)	$Z_{(n=23)} = -0.4$		0.713
Marital status					
Married/cohabiting	6 (67%)	6 (43%)	–		0.400
Widowed	3 (33%)	8 (57%)			
Primary caregiver					
Partner (+ others)	5 (56%)	6 (43%)	–		1.00
(Combination of) others, not partner	4 (44%)	8 (57%)			
BADL performance (0–100)	87.2 (± 12.8; 89.0)	84.9 (± 15.5; 87.5)	$Z_{(n=23)} = -0.3$		0.800
IADL performance					
Initiative (0–36)	14.4 (± 8.4; 16.0)	18.1 (± 9.0; 15.0)	$Z_{(n=22)} = -0.7$		0.504
Required assistance (0–44)	22.7 (± 9.0; 22.0)	22.1 (± 9.2; 23.5)	$Z_{(n=23)} = -0.1$		0.900
Number of diseases	2.3 (± 1.2; 3.0)	2.6 (± 1.2; 2.0)	$Z_{(n=23)} = -0.3$		0.769
Medication use					
Total number of medications	4.4 (± 3.3; 5.0)	3.9 (± 2.2; 4.0)	$Z_{(n=23)} = -0.4$		0.703
Use of psychotropic medications					
Yes	2 (22%)	4 (29%)	–		1.00
No	7 (78%)	10 (71%)			
Number of psychotropic medications	0.3 (± 0.7; 0.0)	0.3 (± 0.5; 0.0)	$Z_{(n=23)} = -0.2$		0.869
Cognitive functioning (0–30)	22.3 (± 4.3; 24.0)	20.6 (± 5.9; 21.5)	$Z_{(n=23)} = -0.6$		0.569
Dementia type					
Alzheimer's disease	2 (22%)	4 (29%)	$\chi^2_{(3, 23)} = 3.1$		0.383
Vascular dementia	3 (33%)	1 (7%)			
Other	0 (0%)	1 (7%)			
Cognitive impairment, not specified	4 (44%)	8 (57%)			
Estimated duration of dementia (years)	3.8 (± 2.1; 3.0)	3.5 (± 2.9; 3.0)	$Z_{(n=22)} = -0.5$		0.590

Data are shown as mean (± SD; median) or as frequency (percentage).

psychotropic medication. Average psychotropic medication use was in all groups equal to or less than 0.5.

In all but one subject, the number of diseases and the number of medications did not change significantly over time. The number of psychotropic medications did not change significantly in any of the subjects. Average rates of changes in the number of diseases and medications did not differ significantly between the two day care groups within the three cohorts (Tables 4–6).

Discussion

The present study is one of few evaluating the effectiveness of day care facilities for functional performance of older people with dementia. The present study included socially oriented day care facilities and its duration was 12 months. Other recent studies on the effectiveness of day care facilities for functional performance included medically oriented

Table 4. Average change over six months in BADL performance, IADL performance, number of diseases and medication use in subjects within cohort A

	GCF (<i>n</i> = 16)	RDCF (<i>n</i> = 8)	Z	<i>p</i>
BADL performance (0 – 100)	-6.4 (± 11.5; -3.8) ^a	-0.8 (± 6.8; -2.9) ^c	-0.6	0.551
IADL performance				
Initiative (0–36)	-2.8 (± 2.9; -3.6)	-3.1 (± 2.0; -3.7) ^c	0.0	1.00
Required help (0–44)	3.3 (± 2.9; 3.5) ^b	4.2 (± 3.4; 4.8)	-1.0	0.302
Total number of diseases	0.3 (± 0.5; 0.2)	0.3 (± 0.4; 0.0)	0.0	0.974
Medication use				
Total number of medications	0.2 (± 0.8; 0.0)	0.5 (± 0.8; 0.3)	-1.3	0.198
Number of psychotropic medications	0.0 (± 0.3; 0.0)	0.0 (± 0.0; 0.0)	0.0	1.00

Data are shown as mean (± SD; median).

^a*n* = 14 due to missing data.

^b*n* = 15 due to missing data.

^c*n* = 7 due to missing data.

Table 5. Average change over six months in BADL performance, IADL performance, number of diseases and medication use in subjects within cohort B

	GCF (<i>n</i> = 3)	RDCF (<i>n</i> = 8)	Z	<i>p</i>
BADL performance (0–100)	-3.0 (± 6.7; 0.0)	0.0 (± 5.7; 0.8)	-0.6	0.537
IADL performance				
Initiative (0–36)	-3.0 (± 4.7; -3.4)	-0.9 (± 4.4; -0.4) ^a	-0.6	0.569
Required help (0–44)	0.2 (± 0.3; 0.0)	1.2 (± 4.1; -0.3)	-0.4	0.683
Total number of diseases	0.2 (± 0.3; 0.0)	0.2 (± 0.6; 0.0)	-0.6	0.545
Medication use				
Total number of medications	0.8 (± 1.4; 0.0)	-0.3 (± 2.0; -0.3)	-1.3	0.199
Number of psychotropic medications	0.2 (± 0.4; 0.0)	-0.1 (± 0.2; 0.0)	-1.5	0.130

Data are shown as mean (± SD; median).

^a*n* = 7 due to missing data.

day care facilities and their duration varied from two to nine months (Baumgarten et al., 2002; Mossello et al., 2008; Zank & Schacke, 2002). In addition, the present study included three cohorts of subjects with varying lengths of stay at the day care facility at study entry, whereas the other studies included only subjects who recently started with day care. Regardless of follow-up period, functional performance declined slightly in the subjects included in the studies evaluating the effectiveness of medically oriented day care facilities. Interestingly, functional performance declined slightly in subjects receiving medically oriented day care and in subjects receiving no day care at all (Baumgarten et al., 2002; Mossello et al., 2008; Zank & Schacke, 2002). The slight decline in functional performance observed in these studies is in line with the rate of change of functional performance in the present study. In addition, despite activities at GCFs being considered more stimulating and to require more physical effort than those at RDCFs (De Bruin, Oosting, Kuin, et al., 2009; Schols & Van der Schriek-van Meel, 2006), no significant

Table 6. Average change over six months in BADL performance, IADL performance, number of diseases and medication use in subjects within cohort C

	GCF (<i>n</i> = 8)	RDCF (<i>n</i> = 10)	Z	<i>p</i>
BADL performance (0–100)	−2.2 (± 7.7; −1.1)	−1.7 (± 3.2; −1.0)	−0.1	0.893
IADL performance				
Initiative (0–36)	−0.5 (± 4.7; 0.0) ^a	−2.3 (± 2.1; −2.6) ^b	−1.0	0.315
Required help (0–44)	2.3 (± 5.8; 3.3) ^a	2.3 (± 3.2; 2.7)	0.0	1.00
Total number of diseases	0.2 (± 0.5; 0.0)	0.3 (± 0.4; 0.0)	−0.4	0.672
Medication use				
Total number of medications	0.1 (± 1.0; 0.0)	0.5 (± 0.8; 0.3)	−0.7	0.497
Number of psychotropic medications	0.2 (± 0.3; 0.0)	0.0 (± 0.2; 0.0)	−1.0	0.338

Data are shown as mean (± SD; median).

^a*n* = 7 due to missing data.

^b*n* = 9 due to missing data.

differences were found between the rates of change in functional performance, the number of diseases, and the number of medications between subjects receiving day care at GCFs and at RDCFs. A reason for the lack of difference between groups from both settings may be that activities at GCFs such as taking outdoor walks, feeding animals, gardening, and meal preparation (De Bruin, Oosting, Kuin, et al., 2009; Schols & Van der Schriek-van Meel, 2006) are not offered frequently or long enough to benefit functional performance more than activities provided at RDCFs. However, our findings together with those from the other recent studies may also imply that medically and socially oriented day care facilities are both not able to affect functional performance in older people with dementia at all.

A first reason may be that day care facilities offer services to people who live in the community. It is likely that the older people are involved in household activities or go outside, for example for going shopping, taking a walk, or visiting family and friends. Literature suggests that such activities are related to functional performance of frail older people (Fujita, Fujiwara, Chaves, Motohashi & Shinkai, 2006; Shimada et al., 2010). The possible effect of additional activities at a day care facility may therefore be overshadowed by activities performed at home. If day care facilities intend to benefit functional performance and to have an added value over no day care, the type, intensity and frequency of their activities and programmes may need reconsideration.

A second reason given for the lack of a beneficial effect of day care for functional performance is that functional impairment, due to cognitive impairment and/or (chronic) diseases when starting with day care, is too severe to be affected by services offered (Baumgarten et al., 2002; Zank & Schacke, 2002). However, it remains to be seen whether this explanation also applies to socially oriented day care facilities. In the present study population impairment at study entry was not severe. Its MMSE score was at least three points higher than mean scores in the other study populations (Mossello et al., 2008; Zank & Schacke, 2002). Also our study population's functional impairment was less severe; the BADL impairment was small and IADL impairment was moderate. The present study did not include subjects receiving no day care. It can therefore not be established whether socially oriented day care facilities, like the GCFs and RDCFs in this study, have an added value over no day care in an earlier stage of the dementia process.

Some critical remarks can be made regarding this study. First, the study was an observational study with cohorts of older people with dementia receiving day care. The composition of the groups under study could therefore not be controlled. Consequently, the two day care groups could differ significantly in gender, age and marital status. However, although these factors are related to functional performance (Fenwick & Barresi, 1981; Hardy, Allore, Guo & Gill, 2008; Leveille, Resnick & Balfour, 2000; Lusardi, Pellecchia & Schulman, 2003; Naumann Murtagh & Hubert, 2004; Williams, Sawyer, Roseman & Allman, 2008), hardly any differences in functional performance were observed between both groups within the three cohorts at study entry. This may justify comparing longitudinal change between subjects from both day care settings, although differing in some demographic characteristics.

Second, enrolling sufficient participants for the study was difficult. The percentage of people that could not be included for reasons varying from ineligibility, upcoming institutionalization, no interest and too much expected burden related to participation was high (~45%). Also the drop-out rate was high (40%), which resulted in a low number of subjects completing the study ($n=53$). The drop-out rate was, however, similar to other studies focusing on dementia patients with follow-up more than three months (Droës, Breebaart, Meiland, Van Tilburg & Mellenbergh, 2004a; Zank & Schacke, 2002).

Third, the functional performance that was rated by the subjects' primary caregivers may have been susceptible to caregiver bias (Nygard & Winblad, 2006). Functional performance would ideally be assessed by direct observation of dementia patients (Bouwens, Van Heugten, Aalten, et al., 2008). However, the time-consuming aspect of this method (Sikkes, De Lange-de Klerk, Pijnenburg, Scheltens & Uitdehaag, 2009), the expected burden for the subjects and their family caregivers and the recent indications for a reasonable accuracy of family caregiver ratings (Cotter, Burgio, Roth, Gerstle & Richardson, 2008) may justify the use of informant-based assessment tools.

Fourth, actual disability and non-performance of IADLs due to traditional gender roles could not be rated separately with the IDDD. As a result, at study entry the initiative of the male subjects may have been underestimated whereas the required assistance may have been overestimated. This may also explain the observed significant difference in the required assistance scores of the GCF and RDCF group within cohort A. The IDDD was selected for its focus on community-dwelling older people with dementia and its distinction between initiative and actual performance of IADLs (Teunisse, 1995). The developers of the IDDD intended to take gender differences in the performance of household activities into consideration. However, we noticed that the IDDD includes several IADLs, such as housekeeping, grocery shopping and meal preparation, that were traditionally not performed by the male subjects in the present study population.

In view of the present differences in demographic characteristics between the GCF and RDCF populations, for future research we recommend studies with a more controlled and experimental character. Since the start of our study, the number of GCFs for older people with dementia has increased (National Support Centre Agriculture and Care, 2009). It may therefore be less complicated to use a design such as a matched-pairs design, as there will be more subjects receiving day care at GCFs who can be matched on gender and age, for example, with subjects receiving regular day care.

It is also recommended to assess subjective well-being parameters. There are indications that older people with dementia at GCFs participate in a larger variety of activities than their counterparts at RDCFs (De Bruin, Oosting, Kuin, et al., 2009; Schols & Van der

Schriek-van Meel, 2006). The household and farm-related activities at GCFs may be more meaningful for the older people than the recreational and leisure activities offered at RDCFs, and may therefore increase their pleasure, interest and self-esteem (De Bruin, Oosting, Enders-Slegers, Van der Zijpp & Schols, 2010). Insight into these subjective well-being indicators may be obtained by observing the subjects at the day care facility (Kinney & Rentz, 2005).

In line with the more client-centred approach in healthcare, it is further recommended to explore ways to measure clinical relevant outcomes of day care on the individual level, by using, for example, Goal Attainment Scaling. By setting individual goals and taking into account individual needs, this method may be more sensitive to capture clinically important change related to receiving day care than standard assessment tools (Bouwens, Van Heugten & Verhey, 2008; Rockwood et al., 2003).

Finally, it is recommended to determine the reason for GCFs enrolling few female older people with dementia. Relevant care institutions may not be familiar with this day care alternative or may assume that GCFs are most suitable for men. It is of interest to all older people with dementia and their caregivers that they are well informed about the different day care types in order to make their own choice for the day care type that suits their preferences and interests best.

Conclusion

This observational cohort study shows that functional performance did not significantly change in a one-year period in community-dwelling older people with dementia attending two to three days of day care per week. The expected difference in effects between GCFs and RDCFs could not be shown. However, this new day care type is a relevant addition to the current care modalities for community-dwelling older people with dementia as it fits developments in the chronic care sector in which non-pharmacological interventions are becoming more and more important.

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Conflict of interest statement

None.

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