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The effects of group living homes on older people with dementia: a comparison with traditional nursing home care

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SUMMARY

Objectives The aim of this study was to investigate the effects of group living homes on quality of life and functioning of people with dementia.

Methods The study had a quasi-experimental design with a baseline measurement on admission and an effect measurement six months later. Participants were 67 residents in 19 group living homes and 97 residents in seven traditional nursing homes. DQOL and QUALIDEM measured quality of life, functional status was examined with MMSE, IDDD, RMBPC, NPI-Q and RISE from RAI. Use of psychotropic drugs and physical restraints was also assessed. Linear and logistic regression analyses analyzed the data.

Results After adjustment for differences in baseline characteristics, residents of group living homes needed less help with ADL and were more socially engaged. There were no differences in behavioral problems or cognitive status. Also after adjusting, two of the 12 quality of life subscales differed between the groups. Residents of group living homes had more sense of aesthetics and had more to do. While there were no differences in prescription of psychotropic drugs, residents of group living homes had less physical restraints.

Conclusions Group living homes had some beneficial effects on its residents, but traditional nursing homes performed well as well. Possible study limitations included the baseline differences between the study groups and the use of different informants on T0 and T1. Future nursing home care may very well be a combination of the best group living care and traditional nursing home care have to offer. Copyright © 2009 John Wiley & Sons, Ltd.

KEY WORDS — quality of life; psychogeriatric nursing homes; Alzheimer's disease

INTRODUCTION

Dementia is a progressive syndrome with often severe consequences for the quality of life of the sufferer and his or her environment. The prevalence of dementia is increasing, especially in developed countries where populations are older and life expectancy continues to grow. For example, the Netherlands already have 200,000 people with dementia on a population of 16 million (1.3%), and this number will more than double in the next three decades (National Health Council, 2002).

The majority of people with dementia is initially cared for at home, but a combination of factors such as severe behavioral problems and exhaustion of the primary caregiver almost always leads to a transition to a nursing home facility (Yaffe *et al*., 2002). In the Netherlands as well as in other countries, nursing home care traditionally resembled hospital care, with large wards and bedrooms for multiple residents. However, in the last decades awareness has increased that this type of facility does not meet the unique needs of people with dementia (Hammer, 1999). A number of initiatives have been taken to improve this situation. One such development is group living care. The ideals

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of group living care state that a group living home is located in an archetypical house, in which residents can stay until they die. Furthermore, the organization of daily life is analogue to that of a normal household, which means that a small staff determines the daily routine together with the residents and informal caregivers (Te Boekhorst *et al*., 2007). Group living homes are built in countries such as Sweden and Japan, and to an ever increasing extent in the Netherlands.

A number of, mainly Swedish, studies researched various aspects of group living care for people with dementia. Some of them describe the background, development and consequences of group living homes (Annerstedt, 1993; Malmberg and Zarit, 1993; Häggström and Norberg, 1996; Annerstedt, 1997). Other research examined resident's life in group living care. One such study showed that group living care might raise the quality of life in its residents for a period of no longer than 2–2.5 years in comparison to traditional nursing home care (Annerstedt, 1994). Other research indicated that the quality of life of residents had risen three months after admission and that this increase was influenced by the acquisition of roles within the group living home (Funaki *et al*., 2005). However, polypharmacy seemed to increase in the two years after admission. Depressive symptoms in particular were present in about 80% of residents, while only 12% received medication for this (Elmståhl *et al*., 1998).

It is not clear from the literature described above if group living homes do indeed offer a better living environment for people with dementia. This can be at least partly attributed to the fact that just one study compared residents of group living homes with residents in traditional nursing homes. Therefore, our study aimed to examine functional status, quality of life and use of psychotropic drugs and physical restraints in residents of group living homes compared to residents in traditional nursing homes.

METHODS

Design

This study had a quasi-experimental design. The experimental group consisted of newly admitted residents in group living homes. The control group included newly admitted residents of traditional nursing homes. There were two measurements, one upon admission and one 6 months later.

The study was approved by the Medical Ethics Committee of the National Institute of Mental Health and Addiction.

Setting

In the Netherlands, nursing homes are publicly funded institutions in which people with psychogeriatric complaints such as dementia receive separate care from those with somatic complaints. For this study, only psychogeriatric group living homes and psychogeriatric nursing homes or nursing homes with psychogeriatric units were selected.

Furthermore, group living homes and traditional nursing homes had to meet a number of eligibility criteria. The criteria for group living homes were formulated on the basis of a Concept Map (Trochim, 1989), that defined group living care (Te Boekhorst *et al*., 2007). Group living homes were included that: (a) had a maximum of six residents; (b) had a maximum of six units; (c) were situated more than 200 meters from the nursing home to which they belonged; (d) prepared their own meals and (e) were built more than 2 years prior to the start of the study.

Twenty group living homes met these criteria, of which nineteen group living homes with 56 units with an average of six residents (range 4–6) per unit agreed to participate. These nineteen group living homes employed 305 nurses.

The eligibility criteria for traditional nursing homes were formed to ensure that group living care was compared with the best traditional nursing home care the Netherlands already had to offer. This meant that traditional nursing homes had to built according to the Dutch 1997 Building Regulation for Nursing Homes, as these facilities offer, among other structural improvements, only single bedrooms. Furthermore, to ensure the contrast between group living home care and traditional nursing home care, the latter needed to be large-scale as well. Therefore, only traditional nursing homes with more than 20 residents per unit were included in the study.

Fourteen nursing homes met the two criteria, of which seven nursing homes with seventeen units with an average of 28 residents (range 20–30) per unit participated. These seven nursing homes employed 437 nurses.

Sample

Newly admitted residents in both group living homes and traditional nursing homes were eligible for the study if they had a primary informal caregiver who could provide the necessary information about their relative. Response rates varied from 42–100% per unit with an average of approximately 68% in traditional nursing homes and 85% in group living homes. The

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main reason for not participating in the study was that it would be too stressful for residents and/or informal caregivers.

During the two-year study period, 132 residents in traditional nursing homes participated in the study upon admission, of which 97 (73.5%) survived to participate in the second measurement. In group living homes 79 residents participated in the study upon admission, of which 67 (84.8%) survived to participate in the second measurement. Multilevel survival rates after six months did not differ significantly between the two groups, but there was a trend towards a higher survival rate in group living homes ($X^2 = 3.92$, $p = 0.059$).

Measures

Functional status. Cognitive functioning was measured with the Standardized Mini-Mental State Examination (Folstein *et al*., 1975; Molloy *et al*., 1991). The S-MMSE contains 19 questions with a maximum score of 30 points. A score over 27 is considered normal, 20–26 indicates mild dementia, 10–19 moderate dementia and below 10 severe dementia.

Assistance needed with Activities of Daily Life was assessed with The Interview for the Deterioration of Daily Living activities in Dementia (IDDD) (Teunisse and Derix, 1997). This scale has good construct validity and test-retest reliability, as well as good responsiveness to deterioration over six months. It consists of eleven items on a five point scale (alpha 0.79). A higher score on the IDDD means more assistance is needed.

Behavioural problems were measured with the Revised Memory and Behavior Problems Checklist (RMBPC) and the Neuropsychiatric Inventory-Questionnaire (NPI-Q). The RMBPC is considered a reliable and valid tool for the empirical assessment of behavioural problems (Teri *et al*., 1992). It consists of three subscales: memory-related behavioural problems (seven items, alpha 0.78), depression (ten items, alpha 0.84) and disruptive behaviour (eight items, alpha 0.70). All items are measured on a five point scale, with a higher score indicating more problems. The second scale used to asses behavioural problems was the NPI-Q. This is an abridged pen-and-pencil version of the Neuropsychiatric Inventory, which is a well validated instrument for examining psychopathology in dementia (Cummings *et al*., 1994). Test-retest reliability of the NPI-Q is acceptable (Kaufer *et al*., 2000). The twelve items of this scale each measure a psychiatric symptom on a four point scale (alpha 0.70). A higher score indicates greater symptom severity.

Social engagement was measured with the Revised Index of Social Engagement (RISE) from the Resident Assessment Instrument (RAI) (Morris *et al*., 1990; Gerritsen, 2004). Compared to the original Index of Social Engagement it has higher content validity, higher internal consistency and better inter-rater reliability. It consists of six items with a dichotomous scale (alpha 0.72). A higher score indicates higher social engagement.

Quality of life. Quality of life was examined with two instruments. The first, the Dementia Quality of Life instrument (DQoL), gives a valid and reliable assessment of six dimensions of quality of life in dementia (Brod, 1990). Although this instrument was originally developed as a direct interview with people with dementia, it was used as a proxy measure in this study. Five of the six dimensions of the DQoL were measured on a five-point scale: Sense of Aesthetics (five items, alpha 0.87), Self-esteem (four items, alpha 0.77), Positive Affect (six items, alpha 0.87), Negative Affect (11 items, alpha 0.89) and Feelings of Belonging (three items, alpha 0.73). The sixth dimension, Overall Quality of Life, was assessed with one item. A higher score indicated a higher outcome on each particular dimension.

The second quality of life instrument used in this study was the QUALIDEM. This scale measures quality of life of residents with dementia in nursing home facilities. Therefore, it was only administered at the second measurement six months after admission. The instrument has sufficient validity and reliability (Ettema *et al*., 2007a,b). This scale assesses nine dimensions of quality of life in dementia, each on a four point scale: Care Relationship (seven items, alpha 0.81), Positive Affect (six items, alpha 0.86), Negative Affect (three items, alpha 0.77), Restless Tense Behaviour (three items, alpha 0.76), Social Relations (six items, alpha 0.80) and Having Something to Do (two items, alpha 0.63). Because the three subscales Positive Self Image, Social Isolation and Feeling at Home proved to be not normally distributed even after transformation, they were not further analyzed here.

Use of psychotropic drugs and physical restraints. Information about the use of psychotropic drugs and physical restraints was given at the second measurement by nursing home physician or psychologist. We asked whether residents were prescribed one or more psychotropic drugs and/or one or more physical restraints.

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Procedure

There were two measurements, one upon admission and one 6 months later. At the first measurement, newly admitted residents' informal caregivers who agreed to participate in the study filled in an informed consent form and a questionnaire about their relative's functional status and quality of life two weeks prior to admission. This measurement thus provided a baseline for the second measurement 6 months later. At this measurement the Certified Nursing Assistant (CNA) who was responsible for the resident filled in the same questionnaire that was used at admission.

At both measurements the MMSE was administered by a nursing home physician or psychologist. At the first measurement it was administered as soon as possible after admission, because administration before admission proved to be logistically impossible. At the second measurement six months later, nursing home physician or psychologist also provided information about the use of psychotropic drugs and physical restraints.

Data analysis

Chi-square tests and multilevel univariate and multivariate linear and logistic regression analyses were used to analyze the data. Model assumptions for regression were verified. Because a number of variables were not normally distributed, they were ln-transformed prior to regression analysis. These variables were duration of memory problems and RMBPC Behaviour subscale at baseline (Table 1), RMBPC depression and behaviour subscales and NPI-Q scale six months after admission (Table 2) and all QUALIDEM subscales except Having Something to Do (Table 3).

The coefficients of the multivariate regression models in Tables 2 and 3 were all adjusted for the results of that particular variable at the baseline measurement shown in Table 1. The QUALIDEM was an exception as it was not measured at baseline. The coefficients in the multivariate regression models in Tables 2, 3 and 4 were also adjusted for age and sex. Other demographic variables from Table 1 did not prove to be confounders, which was considered present when addition of these variables led to a change of ten percent or more in the coefficient of the predictor variable. MMSE-score at baseline also proved to be a confounder for all outcome variables, except IDDD-score. Thus, all multivariate regression coefficients in Tables 2 (except IDDD-score), 3 and 4 were adjusted for baseline MMSE-score as well.

RESULTS

Participants

Table 1 shows that residents in group living homes were more often single females who lived at home prior to admission. Univariate regression analysis showed that, while there were no differences in behavioral problems or social engagement, residents of group living homes had a better cognitive status and needed less assistance with ADL.

Functional status

The results of both univariate and multivariate regression analysis in Table 2 show that residents of group living homes needed less assistance with Activities of Daily Living (IDDD) on the second measurement. However, the mean IDDD scores in Table 2 indicate that both groups still needed a large amount of assistance with ADL. Furthermore, a comparison between mean IDDD scores on admission and six months later (Tables 1 and 2) seem to indicate a decline in this element of functional status for both groups. The significance of the adjusted regression coefficient in Table 2 shows however that this deterioration was less pronounced in residents of group living homes.

Univariate regression analysis in Table 2 shows that residents of group living homes were significantly more socially engaged on the second measurement than their counterparts in traditional nursing homes (RISE from RAI). This difference, although smaller, remained significant after adjustment for baseline RISE score, baseline MMSE score, age and sex in the multivariate model. A comparison between mean RISE scores in Tables 1 and 2 seems to indicate that both groups were more socially engaged on the second measurement than at admission. However, the significant adjusted regression coefficient shows that this improvement was greater in residents of group living homes.

The other measures of functional status, cognitive status (MMSE) and behavioral problems (RMBPC subscales and NPI-Q), did not differ between the two groups on the second measurement. Univariate regression analysis in Table 2 shows that residents of group living homes had a higher MMSE score on the second measurement, but this difference was not significant in multivariate regression as it was already present at admission (Table 1). When comparing mean RMBPC and NPI-Q scores in Tables 1 and 2, they seem to indicate an improvement in behavioral problems in both groups, which were not very severe

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Table 1. Characteristics of residents upon admission

	Nursing homes ($n = 97$)		Group living homes ($n = 67$)		χ^2
	N	%	*N*	%	
Gender					7.74*
Male	26	26.8	6	9.0	
Female	71	73.2	61	91.0	
Education level					0.26
Low	48	49.5	33	50.0	
Medium	38	39.2	28	42.4	
High	11	11.3	5	7.6	
Living situation prior to admission					5.99*
At home	41	47.1	30	71.4	
Other institution	46	52.9	12	28.6	
Marital status					4.51*
Married	21	21.9	5	7.5	
Single	75	78.1	62	92.5	
Number of children					1.02
0	12	12.4	6	8.9	
1–3	54	55.7	44	65.7	
> 3	31	31.9	17	25.4	
	M	95% CI	M	95% CI	B (95%-CI)[a]
Age	83.6	81.1–86.1	81.2	79.7–82.7	−2.43 (−5.31–0.46)
Duration memory problems[b]	5.6	4.7–6.4	4.9	4.1–5.9	−0.09 (−0.27–0.08)
MMSE	10.3	8.3–12.3	15.4	13.5–17.3	5.09** (2.33–7.84)
IDDD	33.0	30.5–35.6	25.9	22.9–28.8	−7.18** (−11.09–3.26)
RMBPC Memory	21.6	21.0–22.3	20.8	19.9–21.7	−0.85 (−1.93–0.24)
RMBPC Depression	13.1	12.3–13.8	14.9	12.8–17.0	1.83 (−0.37–4.03)
RMBPC Behavior[b]	6.7	6.0–7.4	6.1	4.9–7.3	−0.03 (−0.11–0.06)
NPI-Q	11.7	10.9–12.8	12.1	10.5–13.8	0.28 (−1.65–2.21)
RISE from RAI	2.9	2.5–3.2	3.2	2.7–3.7	0.32 (−0.26–0.91)

Range scales:
Mini Mental State Examination 0–30; Interview for the Deterioration of Daily life in Dementia 0–44; Revised Memory and Behaviour Problems Checklist Memory 0–28; Revised Memory and Behaviour Problems Checklist Depression 0–40; Revised Memory and Behaviour Problems Checklist Behaviour 0–32; NeuroPsychiatric Inventory-Questionnaire 0–36; Revised Index Social Engament 0–6.
*$p < 0.05$; **$p < 0.01$.
[a]Nursing homes = 0; group living homes = 1.
[b]Ln-transformed in regression model.

even at admission. This improvement was not significantly greater in either group.

Quality of life

As shown in Table 3, one of the six subscales of the DQoL differed significantly between the two groups. On the second measurement, residents of group living homes had a greater sense of aesthetics than residents of traditional nursing homes: the former enjoyed their surroundings sometimes to often, while the latter only seldom to sometimes did. There were no differences in the other subscales. Mean scores on these subscales indicated a reasonable quality of life for both groups.

Results of both univariate and multivariate regression analysis in Table 3 show that the QUALIDEM subscale Having Something to Do differed significantly between the two groups on the second measurement. Residents of group living sometimes had something to do, while residents of traditional nursing homes only seldom had something to do. Univariate regression analysis indicated that residents of group living had better social relations, but after adjustment for age, sex and baseline MMSE-score, this difference was no longer significant. There

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Table 2. Functional status of residents 6 months after admission

	Nursing homes $n=97$)		Group living homes $n=67$)		Nursing homes vs. Group living homes[a] §			
	M	*95%-CI*	*M*	*95%-CI*	*B unadj.*	*95%-CI*	*B adj.*[c]	*95%-CI*
MMSE	8.9	6.2–11.6	13.0	10.4–15.6	4.11 *	0.38–7.85	0.54	−1.43–2.50
IDDD	34.6	31.9–37.2	28.3	26.3–30.3	−6.30**	−9.6–3.0	−4.37**	−7.06– −1.69
RMBPC Memory	17.2	14.8–19.7	15.8	14.3–17.3	−1.40	−4.26–1.46	−0.30	−3.21–2.61
RMBPC Depression[b]	8.0	7.4–8.6	8.9	7.4–10.5	0.006	−0.04–0.15	0.01	−0.12–0.14
RMBPC Behavior[b]	5.4	4.7–6.0	4.5	3.5–5.4	−0.05	−0.13–0.03	0.02	−0.09–0.14
NPI-Q[b]	8.8	7.5–10.1	7.5	6.2–8.7	−0.07	−0.17–0.02	−0.04	−0.13–0.04
RISE from RAI	3.2	2.6–3.7	4.5	4.0–5.0	1.32***	0.58–2.10	0.79*	0.11–1.50

Range scales:
Mini Mental State Examination 0–30; Interview for the Deterioration of Daily life in Dementia 0–44; Revised Memory and Behaviour Problems Checklist Memory 0–28; Revised Memory and Behaviour Problems Checklist Depression 0–40; Revised Memory and Behaviour Problems Checklist Behaviour 0–32; NeuroPsychiatric Inventory-Questionnaire 0–36; Revised Index Social Engament 0–6.
*$p<0.05$; **$p<0.01$; ***$p<0$ .001.
[a]Nursing homes = 0; group living homes = 1.
[b]Ln-transformed in regression model
[c]All outcome variables are adjusted for age, sex, MMSE-score on T0 and scale-score on T0, except MMSE and IDDD which are adjusted for age, sex and scale-score on T0.

Table 3. Quality of life of residents 6 months after admission

	Nursing homes $n=97$)		Group living homes $n=67$)		Nursing homes *vs* Group living homes[a]			
	M	*95%-CI*	*M*	*95%-CI*	*B unadj.*	*95%-CI*	*B adj.*[d]	*95%-CI*
DqoL								
Sense of aesthetics	7.1	5.2–8.9	10.8	9.5–12.2	3.78 †	1.49–6.10	3.01*	0.54–5.48
Self-esteem	6.6	5.0–8.1	7.8	6.8–8.8	1.24	–0.62–3.10	−0.18	−1.66–1.31
Positive affect	12.1	11.2–13.0	13.7	12.3–15.1	1.55	−0.12–3.22	0.93	−0.96–2.82
Negative affect	16.9	14.3–19.6	18.6	16.6–20.5	1.62	−1.64–4.87	0.79	−3.10–4.68
Feelings of belonging	5.5	4.7–6.3	6.6	5.8–7.4	1.14	0.02–2.30	0.13	−0.85–1.12
Overall quality of life	2.0	1.8–2.2	2.3	2.0–2.6	0.30	−0.10–0.71	0.04	−0.38–0.47
QUALIDEM								
Care relationship[b]	6.1	5.6–6.6	5.3	4.2–6.4	−0.04	−0.12–0.04	−0.01	−0.11–0.10
Positive affect[b]	4.7	4.0–5.4	4.0	3.1–4.8	−0.05	−0.13–0.02	−0.01	−0.08–0.07
Negative affect[c]	3.4	2.7–4.2	3.5	3.0–4.0	0.00	−0.05–0.07	0.02	−0.04–0.08
Restless tense Behavior[c]	3.5	2.1–4.7	3.4	2.4–4.2	−0.01	−0.12–0.11	0.04	−0.04–0.12
Social relations[b]	7.3	5.7–8.9	4.8	3.4–6.1	−0.16*	−0.29–−0.03	−0.002	−0.13–0.09
Having something to do	1.9	1.3–2.7	4.3	3.8–4.8	2.36***	1.50–3.22	1.58**	0.61–2.55

Range scales:
Dementia Quality of Life: Sense of aesthetics 0–20; Self-esteem 0–16; Positive affect 0–24; Negative affect 0–44; Feelings of belonging 0–12.
QUALIDEM: Care relationship 0–21; Positive affect 0–18; Negative affect 0–9; Restless tense behaviour 0–9; Social relations 0–18; Having something to do 0–6.
*$p<0.05$; **$p<0.01$; ***$p<0.001$.
[a]Nursing homes = 0; group living homes = 1.
[b]Ln-transformed in regression model, *lower* score means *better* outcome.
[c]Ln_transformed in regression model.
[d]All outcome variables are adjusted for age, sex, MMSE-score on T0 and scale-score on T0, except MMSE and IDDD which are adjusted for age, sex and scale-score on T0.

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Table 4. Use of psychotropic drugs and physical restraints 6 months after admission

	Nursing homes $n = 97$)		Group living homes $n = 67$)		Nursing homes *vs* group living homes[a]			
	Number	*%*	*Number*	*%*	*OR unadj*	*95% CI*	*OR adj*[b]	*95% CI*
Psychotropic drugs					−0.05	−1.06–0.97	0.01	−0.97–0.99
No	29	34.9	18	36				
Yes	54	65.1	32	64				
Physical restraints					−2.15**	−3.40–−0.90	−1.66*	−2.94–−0.37
No	42	50.6	44	89.8				
Yes	41	49.4	5	10.2				

*$p < 0.05$; **$p < 0.01$.
[a]Nursing homes = 0; group living homes = 1.
[b]Adjusted for age, sex and MMSE-score on T0.

were no differences in the other subscales. Mean scores on these subscales again indicated a reasonable quality of life for both groups.

Use of psychotropic drugs and physical restraints

Table 4 indicates no significant difference in the use of psychotropic drugs in both groups: approximately 65% of residents in both group living homes and traditional nursing homes was prescribed one or more psychotropic drug. However, there was a significant difference in use of physical restraints. In group living homes 10% of residents was prescribed one or more physical restraint, while this was the case for 50% of residents in traditional nursing homes. Multivariate regression analysis showed that this difference remained significant after adjustment for age, sex and baseline MMSE-score.

DISCUSSION

This study aimed to examine the effects of group living homes for people with dementia. To this end, we compared functional status, quality of life and the use of psychotropic drugs and physical restraints in residents of group living homes and traditional nursing homes. The results show that group living homes do have some beneficial effects on residents. They needed less help with Activities of Daily Living and were more socially engaged. Moreover, residents of group living homes had more sense of aesthetics and had more to do. They were also prescribed less physical restraints. However, we could not find differences in cognitive status and behavioral problems, such as depression and psychiatric symptoms. Furthermore, there were no differences in the large majority of quality of life scales and in the prescription of psychotropic drugs.

There were a number of possible limitations to this study. First of all, residents in both facilities were followed for only 6 months, while a longer follow-up period may have yielded valuable additional information. However, as with all research with frail elderly, the high mortality rate makes this very difficult.

A second possible limitation is that information about residents was given by two different observers. Informal caregivers of residents filled in the questionnaire on admission of their relative, while six months later the same questionnaire was filled in by a Certified Nursing Assistant. This might have influenced the comparability of both measurements. However, we deemed that informal caregivers of residents, while being well acquainted with the situation before admission, were not sufficiently aware of the functional status and quality of life of the resident in the nursing home facility to provide reliable information about it. Conversely, CNAs cannot provide reliable information about functional status and quality of life of the resident prior to admission. Therefore, two different informants on both measurements were indicated. To increase comparability of both measurements, we encouraged both informal caregivers and CNAs to consult others when uncertain about items on the questionnaire. However, as we did not check that this advice was followed, it remains unclear whether, and if so to what extent, the differences between the two measurements were actually caused by the two different informants.

Another limitation could be that the Dementia Quality of Life (DQoL) was used as a proxy measure in this study, while it was originally intended as a direct interview with the person with dementia. The

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KEYPOINTS

- Residents are somewhat better off in group living homes.
- Modern traditional nursing homes offer residents very good care as well.

reason for this decision was that quality of life needed to be assessed *retrospectively* at baseline, as participants were selected for the study after admission. We felt people with dementia would not be able to do this reliably. However, although caregiver and patient ratings on quality of life can differ substantially, it is not yet known which report is most accurate (Ready *et al*., 2004). Also, research shows that patient and caregiver ratings at least agree on the factor structure of the DQoL (Ready *et al*., 2007). Still, although the study design necessitated the decision, the use of the DQoL as a proxy instrument remains questionable. Moreover, we do not know how the use of these proxy ratings influenced the quality of life scores.

A fourth possible limitation is that cognitive status of residents was not assessed prior to admission, but shortly after. However, numerous studies indicate that cognitive status is not significantly influenced by transition to a nursing home facility (Engle, 1985; Walker *et al*., 2007). Therefore, we considered the MMSE score at the first measurement to be indicative of cognitive status shortly before admission.

Last but certainly not least, the most important limitation of this study is that it was not a Randomized Clinical Trial (RCT), but had a quasi-experimental design. The reason for this was that it was logistically, but above all ethically impossible to randomly assign new residents to either group living homes or traditional nursing homes. However, this decision had obvious consequences. Baseline results indicate that new residents in group living homes differed from those in traditional nursing homes. Specifically, they seemed to have a better cognitive and functional status at admission. We adjusted the results after 6 months for these differences at baseline, so the analyses are statistically correct. However, if the two study groups really were dissimilar, their rate of decline might have differed as well, independent of the type of nursing home care they received. We do not know to what extent this phenomenon has influenced the results.

The differences in resident characteristics also reveal a major clinical dilemma of group living care: is it suitable for all people for dementia? The results of our study do not provide an answer, but the baseline results suggest that the group living homes participating in this study only admit a certain type of resident. But what about residents who do not fit this profile? Group living care may lose a great deal of its initial appeal if only a small group profits from it, especially since the number of people with dementia is rising so rapidly. However, Dutch policy is already focusing on integrating group living care and traditional nursing home care. As a consequence, future nursing homes will most likely consist of small scale group living care within large scale nursing homes. Although its effectiveness needs to be studied, this approach may very well give people with dementia the best of both ways: the expertise of large nursing homes within the intimate environment of group living homes.

CONFLICT OF INTEREST

The authors had no conflicts of interests during any part of the study. Sponsors had no role in the design, collection, analysis and interpretation of the data, nor in writing the report and the decision to submit it for publication.

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