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Quality of life in small-scaled homelike nursing homes: an 8-month controlled trial

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Abstract

Background: Quality of life is a clinical highly relevant outcome for residents with dementia. The question arises whether small scaled homelike facilities are associated with better quality of life than regular larger scale nursing homes do.

Methods: A sample of 145 residents living in a large scale care facility were followed over 8 months. Half of the sample ($N = 77$) subsequently moved to a small scaled facility. Quality of life aspects were measured with the QUALIDEM and GIP before and after relocation.

Results: We found a significant Group x Time interaction on measures of anxiety meaning that residents who moved to small scale units became less anxious than residents who stayed on the regular care large-scale units. No significant differences were found on other aspects of quality of life.

Conclusions: This study demonstrates that residents who move from a large scale facility to a small scale environment can improve an aspect of quality of life by showing a reduction in anxiety.

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Keywords: Dementia, Long term care, Nursing home, Quality of life

Background

Improving the Quality of Life (QOL) in residents with dementia would be a clinical most relevant treatment outcome, since there is no cure for this progressive syndrome. QOL is a multidimensional concept [1–3]. One of the practical difficulties in assessing QOL in dementia is that the cognitive functions that are needed to respond adequately to the interview questions usually deteriorate with the progression of the syndrome [4]. Therefore, QOL is usually measured using more indirect observational measures [5–7]. One concern with respect to the validity of these observation measurements is that their assessment significantly depends on the clinical experience of the investigator [8, 9].

There are significant relationships between proxy based QOL measurements such as positive affect on the one hand and severity of neuropsychiatric symptoms such as agitation and depression on the other hand [10].

Severity of depressive symptoms shows the strongest relationship with QOL [11, 12].

Special Care Units (SCU) for residents with dementia can provide an increase of QOL [13–15]. In the Netherlands most persons with severe dementia reside in two different types of SCUs; regular SCUs and Small Scaled Homelike SCUs. There are also nursing homes for elderly persons with less severe dementia or somatic disabilities. In regular SCUs, residents are nursed in groups of 20–30 persons a ward with shared bedrooms [16, 17] whereas small scaled homelike SCUs provide care for groups of 7–8 persons with individual bedrooms [18]. In small scaled homelike facilities the staff are trained in person-centered care [19] and the residents participate in meaningful household activities such as cleaning, preparing meals and folding up the laundry. The daily environment encompasses a kitchen, garden and other homelike elements [18]. In regular SCUs household activities are coordinated centrally with little or no cooperation of the residents [20].

In the Netherlands it is generally assumed that small scaled homelike SCUs are more beneficial concerning

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social support, safety, familiarity and experienced congeniality for residents with dementia compared to regular SCUs [21]. Consequently, there has been a tendency over the last decade to convert from regular to small scaled homelike SCUs [21].

Research shows different effects in the perception of nursing personnel and family. It has been shown that nursing personnel in small-scale units experience less workload, more autonomy and more social support from their colleagues [21] or no difference in job satisfaction and motivation [22]. Family members experience less burden and report more satisfaction with the nursing staff [22].

In this study we examined the possible beneficial effects on quality of life of older people with moderate to severe dementia who moved from a large SCU to a small scaled homelike SCU. Based on earlier research [23, 24], our hypothesis was that residents in a small scaled homelike SCU experience more quality of life than residents living in regular care.

Methods

Study design

The study is an 8-month longitudinal non-randomized experimental study in which people stayed in an intervention and control group.

Settings

Residents with advanced dementia mostly live in specially designed homelike SCUs in the Netherlands. Residents live in wards with 7–8 residents instead of living in regular SCUs with 20–30 residents in one ward. Most small scaled facilities are located within a larger care facility.

The participating SCUs we selected were comparable at the start of the study in terms of number of residents, type and number of staff members, facility size and geriatric treatment. The residents lived in non-profit collective nursing homes for residents with dementia in the Northern part of the Netherlands. In one nursing home, residents moved to a small scaled homelike facility because the building did no longer meet the current health care standard (experimental group). The control group was selected from within the same institute in order to ensure comparability between both groups.

Procedure

At the start of the study, all residents stayed in two regular SCUs, with 20–30 residents per ward, of one mental health care institute in the Netherlands. One group, which was connoted as the intervention group, moved after 2 months to a small scaled homelike SCU, with 7–8 residents per ward, situated in a large building. The entire nursing staff of the intervention group received a training focused on the new accommodation. This 9-h training

was focused on person-centered care [25] for residents with dementia. This training was performed by external and internal trainers and was part of the organizational transfer of the residents.

Residents in the control group remained in their large-scale living environment and received care as usual with no special training for the personnel. The resident – staff ratio and allocation to residents stayed the same for both conditions. After 3 and 6 months, the assessment procedure was repeated in both groups. The intervention group was located in a rural village, the control group in a small city. For a flowchart of resident inclusion, see Fig. 1.

Different proxy measurements, a questionnaire and information from the medical records were used to collect the data. Part of the data was collected directly from all residents by specially trained research assistants (global cognitive functioning and mood). Other data were collected by trained primary nurses (QOL and neuropsychiatry). The research assistants and primary nurses were trained by a senior psychologist during a specially organized training session.

The observation lists of a single resident were filled in by two nurses in order to improve the inter-rater reliability. The research leader was available and could be consulted during the moments of data collection. The data collection was performed within the different care facilities and therefore not blinded.

Ethical issues

The study was approved by the Ethical Committee of the department of Psychology of the University of Groningen, the Netherlands (no. PPO008093), registered 3 June 2009. The legal representatives of the residents provided written informed consent and the residents verbal consent. In case the resident expressed either verbally or non-verbally the wish to end the examination, the examination was directly terminated.

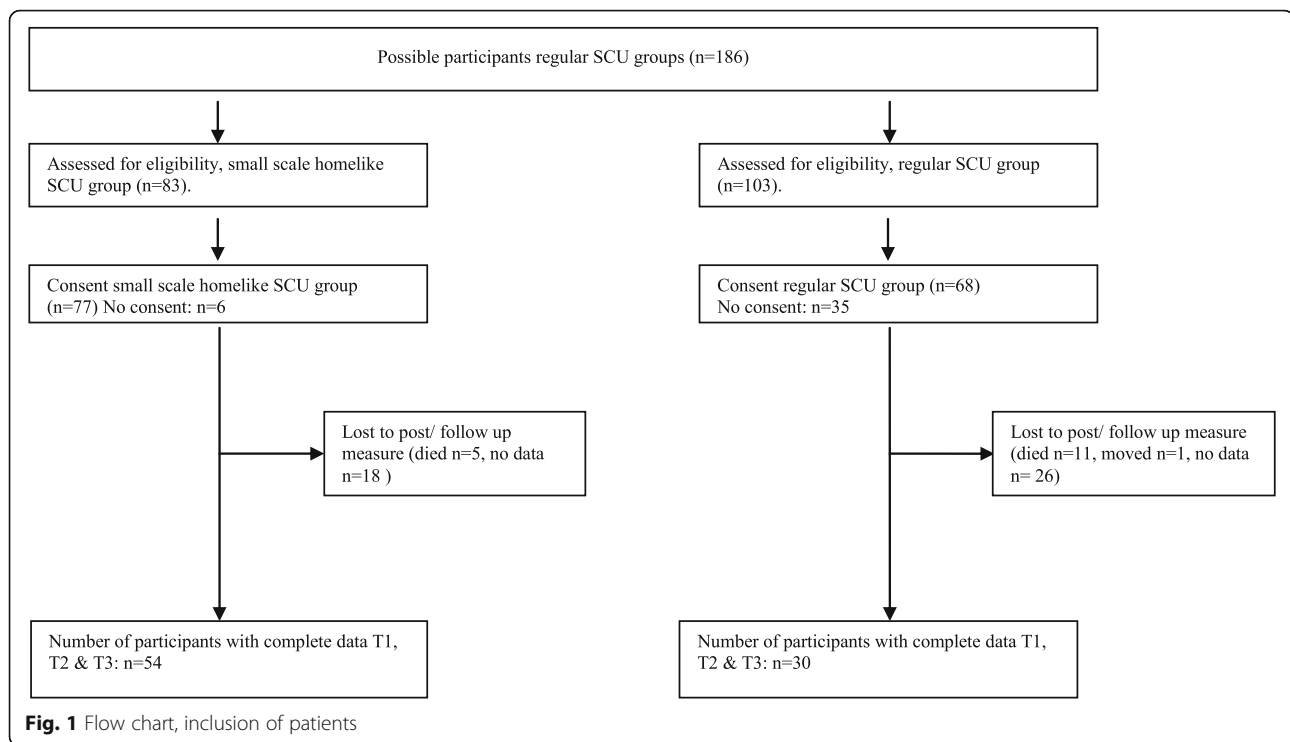
Materials

Global cognitive functioning

The Standardized Mini Mental State Examination (SMMSE) [26] was used to measure global level of cognitive functioning. This screening instrument contains items measuring long and short term memory, orientation, constructional ability, language and the ability to follow up commands. A higher score stands for better cognitive functioning (the maximum score is 30).

Mood

Besides the above proxy rating of symptoms of depression, the Geriatric Depression Scale (GDS) [27–29] was used to measure symptoms of depression directly from the resident with dementia. Questions were presented verbally to the resident and contains a 15-point scale. A



score of 5 points or higher is considered as a cut off for the presence of depression [27].

Quality of life

We used the QUALIDEM as an estimate for quality of life [30–32]. This observation instrument is specially designed to assess the quality of life of residents with dementia in SCUs. The validity and reliability is sufficient [31]. The QUALIDEM contains nine subscales of behavior with 40 items rating; care relationships (7 items), positive affect (6), negative affect (3), restless tense behavior (3), positive self-image (3), social relations (6), social isolation (3), feeling at home (4) and having something to do (2). All nine dimensions were used for this study. Each scale contains a four-point scale (never, seldom, sometimes, often). A higher score indicates a higher quality of life.

Neuropsychiatry

Relevant neuropsychiatric symptoms were collected with subscales of the Behavioral Observation Scale for Intramural Geriatric Psychiatry (Gedragsobservatieschaal voor Intramurale Psychogeriatric (GIP)) [33]. This observation list is specially designed for observation of residents with dementia in SCUs and contains 14 subscales. We used the 6 dimensions that we believed to be most relevant to a study of quality of life; namely Not social behavior (maximum score 24), Apathy (maximum score 18), Insubordinate behavior (maximum score 15), Suspicious behavior (maximum score 21), Depressive behavior (maximum

score 18) and Anxious behavior (maximum score 18). Each scale contains a four-point scale (minimum score of 1, maximum score of 4). A higher score indicates a worse outcome.

Data analysis

Data were analyzed using SPSS version 24. Descriptive analyses were used to present the characteristics of the residents. Possible differences between the intervention and control group at baseline were assessed by independent *t*-tests and Chi-squared tests.

We applied univariate analyses of covariance to analyze the dependent variables QUALIDEM and GIP to explore possible differences in quality of life over time (three moments of measurement) between the two resident groups: two months before intervention (T0), 3 months after intervention (T1) and 6 months after intervention (T2). The baseline-score was used as covariate and the post or follow-up scores as dependent variable. The between subjects factors were the type of SCU (large vs small) and the individual resident.

Level of significance was set at $p < .05$. Effect sizes (eta squared, 95% CI) between .01–.05 was considered small, between .06–.13 moderate and .14 and higher large [34].

Results

Resident characteristics

At baseline, we included a total number of 145 residents living in two large nursing facilities. They were all

residents of SCUs in a moderate to severe stage of dementia as reported in their medical records. To recruit residents, two nursing homes were invited to participate ($N = 186$). A total number of 145 legal representatives of participants provided written and verbal informed consent to the study, 41 representatives did not respond. Due to missing data ($N = 44$), diseased ($N = 16$) and moving to another nursing home ($N = 1$), 84 residents could be included eventually. Part of the data of this sample has been also been described in other studies [35, 36].

Baseline characteristics

Resident characteristics at baseline are presented in Table 1. We found no significant differences between the large scale unit group and the small-scale unit group concerning age, gender, level of education, global cognitive functioning and mood. Both groups consisted of residents that were over 80 years of age, mostly female who generally had followed elementary levels of education (i.e. primary school and no further education) [37]. Type of dementia was registered according to the information in the medical record (Table 1). Level of global cognitive functioning (as estimated with the standardized MMSE) could be categorized as severely impaired. In both groups, mean scores on the GDS indicated that in either group, residents showed depression scores below cut off (see Table 2).

SMMSE data were collected from 43 residents in the small scaled group (intervention) and from 41 residents in the regular care group (control). Information about mood (GDS) was assessed in 37 residents in the intervention group and in 31 residents in the control group. Observational data was collected for 68 residents in the intervention group and 52 residents in the control group at baseline.

The QOL variable ‘suspicious behavior’ shows a significant difference at baseline ($p = .017$) implicating more suspicious behavior in the regular care group (t-test,

Table 1 Resident characteristics at baseline

Dementia type	Small scale homelike SCU group N (%)	Regular SCU group N (%)
Dementia nos	18 (23)	26 (38)
Alzheimer’s dementia	24 (31)	13 (19)
Mixed dementia	6 (8)	11 (16)
Vascular dementia	5 (7)	8 (12)
Lewy body dementia	1 (1)	1 (2)
Frontotemporal dementia	0 (0)	4 (6)
Other ^a	4 (5)	1 (2)

^aParkinson dementia, alcohol dementia, Korsakov, semantic dementia, corticobasal degeneration

Table 2 Type of dementia of the residents

	Small scaled homelike group M(SD) ^a	Regular care group M(SD) ^a	Test statistic*
Sample size (n)	77	68	
Age	83.4 (6.1)	82.8 (7.6)	.611 ¹
Gender			.671 ¹
Male	24 (31%)	19 (28%)	.674 ¹
Female	53 (69%)	49 (72%)	
Education ^b	3.3 (1.4)	3.3 (1.4)	.901 ²
Global cognitive function ^c	8.7 (6.5)	8.4 (6.5)	.802 ¹
Mood ^d	1.3 (1.2)	1.0 (0.8)	.187 ¹

^aunless indicated otherwise

^bconform Verhage [37], Low = category 1 + 2 + 3^b, Middle = category 4 + 5^b, High is category 6 + 7^b

^cSMMSE, Standardized Mini Mental State Examination

^dGDS, Geriatric Depression Scale

* $p < 0.001$; ²pearson chi square test; ¹t-test

equal variances not assumed, $p > 0.05$). For all other QOL variables no significant differences were found at baseline (see Table 3). For both groups, at baseline, residents show average [38] scores on the QUALIDEM items care relationship, positive and negative affect, restless behavior, positive self-image, social isolation, feeling at home and having something to do. A score below (1 SD) average was found for having social relations. The GIP scores show scores slightly above average (1/2–1 SD) ([33, 39]) for not social behavior and apathy. The subscales insubordinate, suspicious, depressive and anxious behavior showed average scores. Overall, the mean scores between the three measurements of both groups showed no significant differences.

Differences in quality of life aspects over time

The raw subscale scores of the 9 QUALIDEM subscale scores, the GDS-15 scores and the 6 GIP scores are presented in Table 3. A significant difference over time between both groups was found for the GIP subscale anxious behavior. Residents in the small-scaled homelike group show significant less anxious behavior compared to the regular care group, with a moderate effect size. The difference in raw score of the small-scaled homelike group (7.9) and the regular care group (9.7) was 1.8 points (follow up measure). No significant differences were found for the other variables (Table 4).

Discussion

In the present study, we compared QOL of residents with dementia living in a small scaled homelike SCU with that of residents living in a regular large-scale SCU. Symptoms of depression and agitation are related to a lower QOL [40]. In our study, residents in a small scaled

Table 3 Raw scores, *M*, *SD*

	Small scaled homelike group (<i>n</i> = 54)						Control group (<i>n</i> = 30)						
	T1	T2		T3		T1	T2		T3		Range		
	<i>M</i> (<i>SD</i>)	95% CI	<i>M</i> (<i>SD</i>)	95% CI	<i>M</i> (<i>SD</i>)	95% CI	<i>M</i> (<i>SD</i>)	95% CI	<i>M</i> (<i>SD</i>)	95%CI			
QUALIDEM													
Care relationship	13.4 (3.6)	12.4–14.4	13.9 (4.1)	12.7–15.0	13.3 (4.4)	12.1–14.4	14.8 (3.6)	13.5–16.1	14.1 (4.5)	12.5–15.6	14.9 (4.1)	13.3–16.5	0–21
Positive affect	12.2 (3.8)	11.1–13.2	12.2 (3.6)	11.2–13.2	11.8 (4.0)	10.6–13.0	12.2 (3.9)	10.8–13.6	12.2 (4.7)	10.7–13.6	11.7 (4.9)	10.1–13.3	0–18
Negative affect	5.5 (2.2)	4.9–6.1	5.5 (1.9)	5.0–6.0	6.0 (2.1)	5.5–6.6	5.7 (2.2)	4.9–6.5	6.2 (2.1)	5.5–7.0	5.5 (2.4)	4.7–6.3	0–9
Restless tense behavior	4.7 ((2.7)	4.0–5.4	4.3 (2.5)	3.7–5.0	4.3 (2.5)	3.6–5.0	4.1 (2.6)	3.2–5.1	4.4 (2.5)	3.5–5.3	3.9 (2.7)	3.0–4.9	0–9
Positive self image	6.6 (2.5)	6.0–7.3	6.7 (2.6)	6.07.4	6.7 (2.8)	6.0–7.5	6.9 (2.4)	6.1–7.8	7.5 (2.3)	6.6–8.4	6.9 (2.7)	5.9–7.9	0–9
Social relations	9.7	8.6–10.7	9.1	8.1–10.2	8.6	7.5–9.6	8.7	7.3–10.1	8.3	6.8–9.7	8.5	7.1–9.9	0–18
Social isolation	5.9	5.3–6.5	5.4	4.8–6.1	5.9	5.2–6.6	6.3	5.5–7.1	6.5	5.7–7.4	5.9	5.0–6.8	0–9
Feeling at home	9.6	8.9–10.2	9.6	8.9–10.2	9.5	8.7–10.3	9.5	8.6–10.3	10.4	9.5–11.6	10.6	9.5–11.6	0–12
Having something to do	1.6	1.1–2.1	1.5	1.1–2.0	1.2	0.7–1.6	1.9	1.2–2.5	1.3	0.7–1.9	1.1	0.5–1.7	0–6
GDS-15													
	1.3	0.8–1.7	1.1	0.7–1.6	0.8	0.5–1.2	1.0	0.5–1.5	1.0	0.5–1.5	0.8	0.4–1.2	0–15
GIP													
Not social behavior	20.5	19.1–21.8	20.9	19.5–22.3	21.1	19.8–22.5	19.5	17.6–21.3	21.1	19.2–22.0	20.6	18.7–22.4	8–32
Apathy	15.0	14.0–16.1	15.3	14.2–16.4	15.3	14.2–16.3	14.6	13.2–16.0	15.9	13.2–16.0	15.4	14.0–16.9	6–24
Insubordinate behavior	10.1	9.3–11.0	10.0	9.3–10.7	9.8	9.0–10.6	10.2	9.1–11.3	10.6	9.6–11.5	10.0	9.0–11.0	5–20
Suspicious behavior	9.9	8.5–11.2	9.6	8.4–10.9	8.7	7.6–9.9	11.3	9.5–13.0	10.7	9.1–12.4	9.5	8.0–11.0	7–28
Depressive behavior	10.0	9.0–10.9	9.7	8.7–10.7	9.3	8.4–10.2	9.6	8.3–10.8	9.2	7.9–10.6	9.1	7.9–10.3	6–24
Anxious behavior	8.1	7.2–9.2	8.3	7.3–9.4	7.9	7.0–8.8	9.8	8.5–11.1	10.3	8.9–11.8	9.7	8.4–10.9	6–24

homelike SCU show significant less anxious behavior compared to residents in a regular SCU over time. Because of the high prevalence of anxiety and relation with other neuropsychiatric symptoms among persons with dementia in nursing homes [41–43], we believe this finding is of clinical relevance. QOL, is associated with the presence of neuropsychiatric symptoms [40, 44].

No other significant differences were found between both groups on other aspects of quality of life. Other research however, showed differences in quality of life, measured by the QUALIDEM, between traditional nursing homes and green care farms [45]. Residents in traditional nursing homes scored lower on positive affect, social relations and having something to do, compared with green care farms, with no differences in quality of life between small scaled living facilities and green care farms [45]. Research on green houses and traditional nursing homes also show more QOL in favor of the small scaled facility [46].

One explanation for these differences is that most of our participants had relatively high scores on the QUALIDEM items. This may implicate that quality of life and wellbeing was already substantially high in both groups at the outline of the study and further improvement of

QOL may not have been possible to register with the QUALIDEM due to ceiling effects [47]. Only the item 'having something to do' showed low baseline scores and this score remained low. In addition, the scores on the GIP questionnaire were also relatively high, implicating the presence of substantial neuropsychiatric behavior in our resident groups. It is possible that this explains why these behaviors responded to our intervention. Our data showed that moving to a small scaled SCU was associated with a decrease of anxiety in our resident group. Anxiety is reported to be present in one third of the residents living in a nursing home [48] and is therefore a very common neuropsychiatric symptom that also is related to wellbeing and quality of life in residents with dementia [49]. The specific decrease of anxiety in small scaled homelike SCUs may be related to the more homelike aspects of these units, including more social support, safety and a recognizable familiar environment [19]. It is possible that the type of care did not have an effect on depression and quality of life [10, 50, 51] since our data indicate that both resident groups had already high levels of well-being before entering the study (as estimated by GDS and QOL measures).

Table 4 *p*-values and eta square quality of life subscales both conditions

	<i>P</i> value ^a	<i>P</i> value ^b	Eta square
QUALIDEM			
Care relationship	.960 ^d	.158	.024
Positive affect	.789 ^c	.955	.000
Negative affect	.610 ^c	.813	.001
Restless tense behavior	.756 ^c	.541	.005
Positive self image	.313 ^c	.377	.010
Social relations	.171 ^c	.415	.008
Social isolation	.615 ^c	.273	.015
Feeling at home	.748 ^c	.235	.017
Having something to do	.678 ^c	.951	.000
GDS			
Mood	.187 ^c	.509	.013
GIP			
Not social behavior	.867 ^c	.650	.003
Apathy	.896 ^c	.902	.000
Insubordinate behavior	.558 ^c	.617	.003
Suspicious behavior	.017 ^{d*}	.222	.019
Depressive behavior	.786 ^c	.635	.003
Anxious behavior	.072 ^d	.008 [*]	.086

^aat baseline^btime x group^cequal variances assumed^dequal variances not assumed

*significant

In addition, it could be argued that the lack of effects on QOL was due to confounding effects of other factors such as, for example, the use of psychotropic drugs. So far, we have neither data on medication used at the time of testing, nor do we know whether the groups differed in the type or amount of drugs prescribed. Furthermore we chose to measure QOL with observations by nursing staff because we believed this to be more accurate than interviews with the residents themselves [16, 52]. It is possible that additional observations by the resident's spouses or other relatives would have improved the sensitivity of our measurements. These are issues that should be worthwhile to pursue in subsequent research.

Strengths and weaknesses of the study

One major strength of our study is its longitudinal design. The type of research that has been done in this field used mostly cross-sectional designs [15]. The advantage of using within-subject measurements is that potential confounding effects of individual differences are minimized. A second strength is that we used the QUALIDEM, an assessment tool that is widely used in other studies as well [52] and is well known for its strong methodological features [8, 53]. The other assessment tool (GIP) however is only generally

used in the Netherlands. In future research the use of other instruments as, for example, the Greater Cincinnati Chapter Well-Being Observation Tool or the Psychosocial Quality of Life Domains questionnaire should be considered [32, 54]. Finally, another merit of our study is that we included a relatively large sample of residents with dementia.

A potential limitation of the present study is the lack of randomization. We did not allocate residents randomly to one of the experimental conditions because of ethical motives in that residents and families should be free to choose the living environment they prefer. Non-randomization can have caused a bias in the answers of the nurses because they expected a better care environment for the residents after the relocation. Another drawback may be that our nurses who assessed the data were not blind to the experimental condition of the resident. This could have influenced the results. Nevertheless, we believe that the within subject design we used forms a major strength of this trial, together with the fact that our resident groups did not differ on quality of life at baseline.

Because of the severely cognitive impaired population, direct assessment measurements with the residents was hardly possible. We collected convergent information about mood by assessing the Geriatric Depression Scale questionnaire verbally to the residents to increase the possibility of a valid answer. However, the answers of the residents will stay limitedly valid.

The QUALIDEM domains positive 'self-image', 'feeling at home' and 'having something to do' cannot be assessed by residents with very severe dementia [55]. In our research, Global cognitive functioning was assessed with the SMSSE. Considering the very low SMSSE scores, we assume that the data presented for these specific subscales is of very limited value. In further research, the stages of dementia severity could be classified conform the Global Deterioration Scale and Functional Assessment Staging [56]. It is relevant to include residents with very severe dementia in future studies.

A final weakness of this research is the lack of registration of comorbidities of the residents besides the type of dementia and neuropsychiatric symptoms. Including comorbid diseases would be preferable in future research.

Conclusions

The study demonstrates that moving to a small-scale care facility is associated with a reduction of anxiety in residents with dementia. These findings add to growing evidence supporting the benefits of small, homelike care facilities on well-being of these residents. The experience of decreased anxiety in residents in small scaled homelike facilities was clinically relevant. One aim of further research could be to unravel what specific aspects of

small-scaled living environments cause this reduction in anxiety in dementia. For example, this may be related to the type of psychosocial climate, certain physical aspects of the environment, the decreased burden in family member or perhaps the increased work satisfaction of the nursing staff. Researching variation and diversity in physical and psychosocial climate within nursing facilities in relation to the former and current individual characteristics of residents can perhaps contribute to a better understanding of the effective aspects of dementia care.

Abbreviations

CI: Confidence Interval; GDS: Geriatric Depression Scale; GIP: Gedragsobservatieschaal voor Intramurale Psychogeriatric; MMSE: Mini Mental State Examination; QOL: Quality of Life; SCU: Special Care Unit

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Availability of data and materials

The dataset used for this article is available on request. For further information on this database, you may contact the PI of the survey, J.S. Kok (j.s.kok@lentis.nl).

Authors' contributions

Conceived and designed the experiments: JSK EJAS. Performed the experiments: JSK. Analyzed the data: JSK. Wrote the paper: JSK MMAN EJAS. Conceived and designed the original study: JSK EJAS. All authors read and approved the final manuscript.

Ethics approval and consent to participate

The study has been approved by the Ethical Committee of the department of Psychology of the University of Groningen, the Netherlands (no. PPO008093), registered 3 June 2009.

All legal representatives of the residents were informed of the goal and procedure of the study and signed an informed consent prior to the study. The residents were invited to agree before each measurement. No measurements were conducted by resistance of any kind of the resident.

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests.

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