



# People with dementia attending farm-based day care in Norway – Individual and farm characteristics associated with participants' quality of life

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## Abstract

Farm-based day care for people with dementia is supposed to improve the participants quality of life by using activities and resources of the farm environment to promote mental and physical health. In this paper, we describe the characteristics of those attending farm-based day care services in Norway and explore the association between individual and farm characteristics and the quality of life. A sample of 94 people with dementia who attended farm-based day care was recruited from 25 farms between January 2017 and January 2018. The data collection was performed using standardized instruments. Information about the farms was retrieved from a former study. The association between the participants' quality of life and their individual and/or farm characteristics was examined with a linear multilevel regression model. The participants had a mean age of 76 years, 62% were men, and 68% had additional education after primary school. Most of them had mild (54.3%) or questionable dementia (18.3%). A few participants used antipsychotics (3.7%), tranquilizers (9.9%) and painkillers (13.6%), while a higher number used antidepressants (30.9%). Quality of life was associated with the experience of having social support ( $p = .023$ ), a low score on depressive symptoms ( $p < .001$ ), and spending time outdoors at the farm ( $p < .001$ ). The variation between the farm-based day care services in the participants' reported quality of life was related to time spent outdoors at the farm. In light of the present study, it seems as farm-based day care is addressing people with dementia in an early stage, dominated by men, with quite good physical and medical condition. The strong association between quality of life and spending time outdoors underscores that facilitation for outdoor activity should be prioritized in all types of dementia care.

## KEYWORDS

activity outdoors, care farms, day care, dementia, farm-based day care, quality of life

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## 1 | INTRODUCTION

The purpose of day care services for people with dementia is to contribute to a better quality of life of the participants by offering meaningful activities and coping experiences in a safe environment (Fields, Anderson, & Dabelko-Schoeny, 2014; Norwegian Ministry of Health & Care Services, 2015). The Norwegian government's action plan on dementia points out the need for diversity in day care services to meet individual's needs and to prioritise a national increase in day care services in general (Norwegian Ministry of Health & Care Services, 2015). Farm-based day care (FDC) aims to meet the requirement for diversity. It serves the same purpose as regular day care located at health care facilities but uses resources from the farm environment and activities that take place on the farm to promote mental and physical health (Hine, Peacock, & Pretty, 2008; Norwegian Ministry of Agriculture and Food, 2013).

Little is known about what characterise people with dementia using FDC services. A Dutch study from 2011 found that most participants at FDC had early stage dementia and were male (de Bruin et al., 2011). The mean age was lower in FDC participants compared to those in regular day care services and more of the attendees were married and lived in their own homes with their partner as their primary caregiver. Additionally, the participants were more physically active and spent more time outdoors at FDC than in regular day care (de Bruin et al., 2011). A recent study found that Norwegian FDCs used a wide variety of both farm environments (e.g. farmyard, nearby cultural landscape, forest or a barn) and farm activities (e.g. working in the garden, plant and animal activity). The participants spent time outdoors daily (Ibsen, Eriksen, & Patil, 2018). Activities such as being involved with nature or with plants or animals have often been described as important for how people with dementia perceive their quality of life (Carver, Lorenzon, Veitch, Macleod, & Sugiyama, 2018; Orr, Wagstaffe, Briscoe, & Garside, 2016).

According to Lawton (1994), quality of life is influenced by: (a) psychological well-being as a positive or negative affect; (b) behavioural competence like social behaviour, physical health and cognitive and functional abilities; (c) the objective environment physical means as well as the persons subjective evaluation of the many facets of the daily environment and (d) the quality of life as perceived by the patients themselves. This is a broad framework but found to be highly relevant when assessing the quality of life in adults with cognitive impairment (Logsdon, Gibbons, McCurry, & Teri, 2002). The four elements of Lawton are integrated into the QoL-AD assessment form (Quality of life in Alzheimer's disease), which are found to be reliable for this population (Bowling et al., 2015; Thorgrimsen et al., 2003). The QoL-AD assessment form reflects the definition of quality of life presented by the WHO in 1995; 'an individual's perceptions of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns' (Saxena & Orley, 1997, s. 263). Research emphasises the value of reflecting the views and perspectives of the person with dementia

### What is known about this topic

- FDC are most often chosen by or offered to men who lives together with a partner and the participants are younger than those in regular day care.
- Activities are performed outdoors every day.

### What this paper adds

- The participants at FDC have higher educational level than those in regular day care.
- The use of antipsychotics, tranquillizers and painkillers are low among FDC attendees, while the use of antidepressants is higher than in comparative groups.
- The participants quality of life is associated with time spent outdoors at the FDC.
- The variation between the participants reported quality of life at the FDC-level are associated with the amount of time spent outdoors at the farm.

when measuring the quality of life. Those with mild to moderate dementia are found to provide reliable perceptions of their own quality of life (Bowling et al., 2015).

Generally, the experience of the quality of life is associated with the experience of social support and social interactions (Beerens et al., 2018; Wolverson, Clarke, & Moniz-Cook, 2016). To prevent isolation and to maintain a meaningful life in the stages of mild and moderate dementia, many people with dementia emphasise the importance of having social relations with others in the same situation as achieved at day care (Eriksen et al., 2016). Furthermore, the quality of life of people with dementia is negatively associated with neuropsychiatric symptoms as depression and reduced functions in daily living (Martyr et al., 2018; Mjørud, Engedal, Røsvik, & Kirkevold, 2017; Rokstad et al., 2016). People with dementia have more neuropsychiatric symptoms than the population in general (Bergh & Selbæk, 2012; Borsje, Lucassena, Wetzelsa, Potd, & Koopmans, 2018) and their use of psychotropic drugs is reported to be high (Bergh & Selbæk, 2012; Borsje et al., 2018; Wergeland, Selbæk, Høgset, Kirkevold, & Söderhamn, 2014). Day care specialised for people with dementia might lead to a reduction in challenging behaviour and the use of psychotropic drugs (Reinar et al., 2011).

Although day care at farms is established and developing in several countries (Haubenhofner, Elings, Hassink, & Hine, 2010), there are limited research about the characteristics of people with dementia attending FDC (Eriksen et al., 2019). Extended knowledge about the population at FDC may be valuable to municipalities and other service providers in their work on adapting services to their care receivers. Furthermore, dementia is a progressive condition that influences the quality of life. Knowledge of which factors of such adapted health services that contribute to the quality of life is important at an individual

level, but it is also important for the development of dementia care in general (Banerjee et al., 2009; Droes et al., 2006; Rokstad et al., 2016). Therefore, there is a need for studies on how individual and farm characteristics are associated with the participants' quality of life.

The present study aims to describe people with dementia who attend FDC in Norway and to explore whether the characteristics of the participants and the FDC are associated with their quality of life.

## 2 | METHODS

### 2.1 | Design and participants

This study reports on data collected in a larger project (Eriksen et al., 2019). A cross-sectional design was used to collect information on the people attending FDC across Norway between January 2017 and January 2018. Thirty FDCs were recruited from both urban and rural municipalities throughout Norway, with a total of 240 users. One hundred and sixty-nine dyads of people with dementia and their next-of-kin met the inclusion criteria. Of those 62 dyads did not want to participate in the study and 19 dyads were not invited to participate by the service providers for other reasons than the inclusion criteria (e.g. illness in the family, health issues). Thus, 94 dyads from 25 FDCs were included, representing 55.6% of those who met the inclusion criteria.

All FDC facilities that offered service to people with dementia in Norway ( $n = 35$ ) were contacted in the autumn of 2016. Information about the study and the inclusion criteria were communicated and the providers at the farm or the personnel from the municipality made the first contact with eligible participants and then their next of kin. Those who were interested in participating were contacted by a researcher, who provided more information about the study. Each farm had few users. Thus, for privacy protection purposes, we did not collect any data about those who did not participate.

The inclusion criteria were that the person with dementia attended the FDC for at least three weeks, lived in his or her own home, and had a next of kin willing to participate who either lived together with the person with dementia or met him/her at a minimum of once a week. The exclusion criteria were that one person in the dyad refused to participate.

The assessment forms were tested in three pilot interviews to evaluate the acceptance and the feasibility of the participants and to ensure that the person with dementia was able to answer them.

### 2.2 | Data collection

The health characteristics of people with dementia were assessed with standardised assessment forms and the information was provided by either the person himself/herself or the next of kin. In most cases, two researchers visited the person with dementia and the

next of kin in their home. Approximately one-hour long interviews with the two informants were conducted simultaneously. In addition, next of kin filled in some forms by themselves. For a few of the participants with dementia, the interview was carried out at the farm and a few next of kin were interviewed by phone. Seven researchers and three research assistants performed the interviews. All data collectors participated in a one-day training course to acquire shared knowledge and skills in how to conduct the interviews. The interviewers used a manual and were supervised by senior members of the team during the data collection period when needed.

Demographic data, such as sex, age, educational level and whether the person with dementia lived alone or not, were registered along with information about the number of days spent at day care, physical activity per week, diagnosis and medication. Psychotropic medications were coded according to the Anatomical Therapeutic Chemical (ATC) Classification System (World Health Organization, 2013) and grouped in accordance with earlier research: antipsychotics (N05A), tranquilisers (anxiolytics (N05B) and hypnotic/sedatives (N05C), antidepressants (N06A) and anti-dementia medication (N06D) (Bergh, Engedal, Røen, & Selbæk, 2011).

### 2.3 | Assessment forms

#### 2.3.1 | Quality of life

The participants' quality of life was evaluated with the Quality of Life-Alzheimer's Disease (QoL-AD) scale (Logsdon, Gibbons, McCurry, & Teri, 1999) answered by the person with dementia. The tool has 13 items regarding the physical condition, mood, memory, personal relationships, functional abilities and financial situation and an overall question about life as a whole. The QoL-AD sum score ranges from 13 to 52 and scores lower than 33 and higher than 37 indicate low and high quality of life, respectively (Conde-Sala et al., 2016).

#### 2.3.2 | Social support

The Oslo Social Support (OSS-3) form was used to assess the participants' subjective experience of social support (Dalgard et al., 2006), answered by the person with dementia. The form has three items regarding the number of their close relations, if others show an interest in their life and if they can ask neighbours for help. The sum score ranges from 3 to 14 and is grouped into three categories: poor (3–8), moderate (9–11) and strong support (12–14) (Bøen, Dalgard, & Bjertness, 2012; Dalgard et al., 2006).

#### 2.3.3 | Cognitive function and severity of dementia

The Montreal Cognitive Assessment (MoCA) (Nasreddine et al., 2005) is a 30-point test that measures the participants' cognitive

status through six domains (visuospatial construction, executive function, episodic memory, attention, language function and orientation). A score below 26 points indicates mild cognitive impairment.

Dementia severity was assessed with the Clinical Dementia Rating Scale (CDR) (Hughes, Berg, Danziger, Coben, & Martin, 1982). The CDR assesses the cognitive and functional performance in six areas (memory, orientation, judgement and problem solving, community affairs, home and hobbies and personal care) and it is scored by the assessor who considers all available information. In the analysis, we used the CDR sum of boxes (CDR-SOB). The CDR-SOB scores range from 0 to 18.0, where scores of 0.5–4.0 indicate questionable cognitive impairment, scores in the 4.5–9.0 range signify mild dementia, scores in the 9.5–15.5 range denote moderate dementia and scores of 16.0–18.0 equal severe dementia (O'Bryant et al., 2008).

The degree of awareness of memory loss was assessed by the researcher using the Anosognosia Rating Scale (REED) (Reed, Jagust, & Coulter, 1993). This is a one-item questionnaire with a 4-point response scale. The numbers 1, 2 and 3 refer to full, shallow and no awareness, respectively, and the number 4 refers to the denial of impairment.

### 2.3.4 | Depression, anxiety and neuropsychiatric symptoms

Depressive symptoms were assessed in dialogue with the participant with the Montgomery Aasberg Depression Rating Scale (MADRS) (Montgomery & Asberg, 1979). This is a 10-item interview-based questionnaire that screens for depressive symptoms with a sum score ranging from 0 to 60. The cut-off score for no depression is 6, while points 7–19 indicate mild depression, and points 20–34 and 35–60 indicate moderate and severe depression, respectively.

Anxiety was assessed by the Rating Anxiety in Dementia-Norwegian version (RAID-N) (Goyal, Bergh, Engedal, Kirkevold, & Kirkevold, 2017; Shankar, Walker, Frost, & Orrell, 1999). The scale consists of 18 statements that measure anxiety with a score range between 0 and 54. Scores of 12 and above indicate significant clinical anxiety. The RAID-N score is based on answers from both the participants and the next of kin and the information is merged to a final score based on the researcher's judgement.

Neuropsychiatric symptoms were assessed with the Neuropsychiatric Inventory questionnaire (NPI) that consists of 12 items, each reporting on one symptom (Cummings et al., 1994). The NPI is rated by the next of kin. Present symptoms were further scored for severity (1–3 points) and frequency (1–4 points). Severity and frequency were then multiplied for each symptom (1–12 points) and the total NPI score (1–144 points) was obtained by summing the scores of the 12 symptoms. A score above three on an individual symptom was classified as a clinically significant symptom (Bergh & Selbæk, 2012).

### 2.3.5 | Physical health status

General physical health was assessed by the researcher with the General Medical Health (GMHR) scale (Lyketsos et al., 1999). The GMHR has four categories (4 = excellent, 3 = good, 2 = fair and 1 = poor) and is rated based on the participants' present physical health status and the number of medications prescribed. The Euro-QoL Visual Analogue Scale (EQ-VAS) was used to describe the participants' subjective experience of health on a scale from zero (worst imaginable health state) to 100 (best imaginable health state) (Kunz, 2010). Physical activity was assessed by asking the participants and their next of kin about how many days per week the participants were physically active for at least 20 min.

Functioning in daily living was measured with the Physical Self-Maintaining Scale (PSMS). The total score ranges between 6 and 30 (Lawton & Brody, 1969). The instrumental activity of daily living (IADL) was measured with the Instrumental ADL scale (IADL) with a possible score between 8 and 31 (Lawton & Brody, 1969). For both scales, a higher score indicates lower functioning. The PSMS and IADL are assessed by proxy.

### 2.3.6 | The farms

The characteristics of the 25 FDC services from which we recruited participants were retrieved from the data material used in our former study (listed in Table 2) (Ibsen et al., 2018).

## 2.4 | Analysis

The statistical analysis was performed with IBM-SPSS version 23 (IBM Corp, 2015). Missing values in the different instruments were imputed on the item level for the cases with at least 50% of the items available. Imputed values were random numbers drawn from the observed distribution in the dataset. The items most imputed are QoL-AD (21 cases), MADRS (12 cases) and OSS-3 (9 cases). The correlation was tested with Pearson's correlation. Demographics and characteristics were presented as frequencies, percentages, and means and standard deviations (SDs) as appropriate.

The present study includes data on two levels (individual and FDC level) and thus, a multilevel regression analysis was performed to check for cluster effects of the quality of life between the FDC services. As the intraclass coefficient (ICC) in the present study was higher than 5%, a restricted multilevel linear regression model was used (Heck, Thomas, & Tabata, 2010; Hox, 2002). ICC is the proportion of the total variance of QoL-AD scores that is accounted for by the clustering (here FDC). To examine the association between the characteristics of people with dementia and the quality of life, a univariate analysis was performed for each variable using quality of life as the dependent variable. The

same procedure was performed to examine the association between the characteristics of the farm and the quality of life of the participants.

The independent variables were then checked for collinearity. The MoCA score and CDR-SOB score had a high correlation ( $r = -.63$ ), indicating that they measured the same phenomenon. Due to fewer missing values in the CDR-SOB, the CDR-SOB variable was included in the models. The IADL and PSMS also had a high correlation and a logical covariation ( $r = .66$ ), and the PSMS variable was kept in the model, as it had the strongest influence on the quality of life in the univariate analysis. Since there were only 94 cases of people with dementia, there were limitations on how many independent variables that could be included in the multivariate models (Field, 2018). Variables with a low association with quality of life in the univariate analysis were excluded from the multivariate analysis ( $p$ -value  $> .5$ ).

Two multivariate multilevel linear regression models were built, adding independent variables in two blocks: first the characteristics of people with dementia (Model 1) and then the variables at the FDC level (Model 2). Using these variables, the proportions of the explained variance at the individual level ( $R_1^2$ ) and the proportion of the explained variance at the FDC level (ICC) ( $R_2^2$ ) were calculated at each step of the model. To make the coefficients comparable to each other, we have estimated z-values of each variable and estimated the regression coefficient for the z-scores (Table 2).

### 3 | ETHICS

The participants were informed about the purpose of the study and asked to give written consent. Three persons with dementia had reduced capacity to consent and the next of kin consented on behalf of them. Both the person with dementia and the next of kin were assured that they could withdraw at any time during the data collection.

The study was approved by The Norwegian Centre for Research Data (No. 49799).

## 4 | RESULTS

### 4.1 | Characteristics of people with dementia

There were more men than women attending the FDC services (Table 1). The participants' age ranged from 58 to 96 years, the majority lived in own home with a partner and 67.8% had completed high school or held a college or a university degree. Sixteen participants (17.0%) attended regular day care in addition to an FDC in the range from one (nine participants) to four (one participant) additional days per week. Fifty-eight participants (65.2%) reported having a high quality of life, 21 (23.6%) had a moderate quality of life and ten participants (11.2%) scored a low quality of life. Social support

(measured by OSS-3) was mostly found to be moderate (48.2%) or strong (43.4%) among the participants.

All participants had cognitive impairment (MoCA) and 84.9% had received a diagnosis of dementia (Table 1). More than half of the participants (54.3%) had mild dementia (CDR-SOB). Seventeen participants (18.3%) had a CDR-SOB score lower than 4.5, indicating questionable cognitive impairment, though 64.7% of them had a dementia diagnosis. Twenty-five participants had moderate dementia (26.6%), while one (1.1%) had severe dementia. Thirty-six participants (38.3%) had full awareness of their memory loss and 47.9% and 13.8% had shallow or no awareness, respectively (REED).

The assessment of depressive symptoms (MADRS) showed that 66.2% reported no symptoms, while 31.5% and 2.3% had mild or moderate depressive symptoms, respectively (Table 1). Of those with no depressive symptoms, 20.3% used antidepressants. Neuropsychiatric symptoms (NPI) were present in 87.2% of the participants and 48.9% had between one and six single symptoms considered to be clinically significant.

This study included participants from 25 of the farms described in our previous study (Ibsen et al., 2018) (Table 2). On the 25 farms, there were an average of 5.9 ( $SD$  1.3) participants and 2.2 ( $SD$  0.6) employees per day, which gives an average of 2.7 participants per employee. Fifteen farms (60.0%) had health-educated personnel with a bachelor's degree. The time spent at the FDC was on average 5.8 hr ( $SD$  1.3) per day and the attendants spent on average 2.9 hr (range 1–4.5) and 1.4 hr (range 0.5–3) outdoors in the summer and winter, respectively. The mean time spent outdoors summer and winter was 2.2 ( $SD$  0.6) hr. All farms but one had animals.

### 4.2 | Characteristics associated with quality of life

The multilevel regression analysis (Table 2, Model 1) shows that social support (OSS-3) and a lower score in depressive symptoms (MADRS) were associated with a higher score in the self-reported quality of life. Also, physical health status (GMHR), the participants' subjective experience of health (EQ-VAS) and anxiety (RAID-N) were associated with quality of life in the univariate analysis. All the FDC characteristics, except for time outdoors, had a low association with quality of life in the univariate analysis ( $p > .8$ ); thus, only time outdoors was entered in the multilevel model (Table 2, Model 2). The profile of Model 1 was maintained when adding the FDC variable time outdoors to Model 2 and this variable was also significantly associated with quality of life in the final model.

The ICC was 17%, and 9.0% of the ICC was explained by participant characteristics. By adding the FDC characteristics to the model, 93.0% of the ICC was explained ( $R_2^2$ ) (Table 2). This means that 14% ( $17\% \times [93\% - 9\%]$ ) of all the variance in quality of life was explained by the variable time spent outdoors. Forty per cent of the variance between the participants ( $R_1^2$ ) was explained by the total model.

Characteristics	Number of participants (n)	Scores
Sex, number (%)	94	
Male		58 (61.7)
Female		36 (38.3)
Age, mean (SD)	94	75.8 (8.3)
Education, number (%)	93	
Primary school		30 (32.3)
High school		38 (40.9)
Collage/University		25 (26.9)
Residence, number (%)	94	
Own House		87 (92.6)
Other (residence connected to care home, collective)		7 (7.4)
Living conditions, number (%)	94	
Married/cohabitant		60 (63.8)
Alone (unmarried, divorced, widowed)		34 (36.2)
Number of days at FDC per week, mean (SD)	94	2.2 (0.9)
Number of physical active days per week ( $\geq 20$ min), mean (SD)	90	2.9 (3.6)
Dementia diagnosis, number (%)	93	79 (84.9)
Medication, number (%)	93	91 (96.8)
Psychotropic medication	81	80 (98.8)
Antipsychotics		3 (3.7)
Tranquilizers		8 (9.9)
Antidepressants		25 (30.9)
Anti-dementia medication		44 (54.3)
Pain-killers		11 (13.6)
QoL-AD, mean (SD)	89	38.6 (5.4)
OSS-3, mean (SD)	83	11.0 (1.1)
MoCA, mean (SD)	87	11.5 (6.2)
CDR Sum of boxes, mean (SD)	94	7.4 (3.2)
REED, mean (SD)	94	1.8 (0.7)
MADRS, mean (SD)	89	4.6 (4.7)
RAID-N, mean (SD)	94	6.3 (5.3)
NPI, mean (SD)	94	12.1 (12.8)
GMHR, number (%)	94	
Poor		0
Fair		17 (18.1)
Good		40 (42.6)
Excellent		37 (39.4)
EQ-VAS, mean (SD)	84	70.0 (18.3)
PSMS, mean (SD)	94	9.2 (3.2)
IADL, mean (SD)	94	21.7 (5.6)

**TABLE 1** Characteristics of the participants at Farm-based day care (FDC)

Abbreviations: CDR, Clinical Dementia Rating scale; EQ-VAS, Euro-Qol Visual Analogue scale; GMHR, General Medical Health scale; IADL, Instrumental Activity of Daily Living; MADRS, Montgomery Aasberg Depression Rating Scale; MoCA, The Montreal Cognitive Assessment; NPI, Neuropsychiatric Inventory's questionnaire; OSS-3, Oslo Social support; PSMS, Physical Self-Maintenance Scale; QoL-AD, Quality of Life Alzheimer's Disease; RAID-N, Rating Anxiety in Dementia-Norwegian version; REED, The Anosognosia Rating Scale.

**TABLE 2** Multilevel regression model of the association between Quality of life (QoL-AD) as dependent variable and characteristics of people with dementia and the Farm based day care (FDC)

	Univariate analysis			Multivariate model 1			Multivariate model 2			
	Regr. Coeff (SE)	p-Value		Regr. Coeff (SE)	Regr. Coeff (SE)	Regr. Coeff Z-score (SE)	p-Value	Regr. Coeff (SE)	Regr. Coeff Z-score (SE)	p-Value
Characteristics of people with dementia										
Sex	1.732 (1.13)	.128		0.729 (0.99)	0.729 (0.99)		.463	0.243 (0.96)	0.243 (0.96)	.801
Age	0.037 (0.7)	.612								
Living conditions, number (%) Married, cohabitant/ Alone	-0.511 (1.20)	.671								
Education (primary school/higher education)	0.501 (1.14)	.662								
Number of days at FDC per week	0.721 (0.66)	.274		-0.168 (0.57)	-0.161 (0.54)		.767	-0.566 (0.56)	-0.542 (53)	.314
Physical active days per week	-0.068 (0.16)	.672								
OSS-3	0.713 (0.29)	<b>.015</b>		2.169 (0.279)	1.171 (54)		<b>.034</b>	0.598 (0.26)	1.190 (0.51)	<b>.023</b>
MoCA	0.157 (0.10)	.132								
CDR	-0.270 (0.19)	.156		-0.164 (0.23)	-0.523 (0.73)		.477	-0.201 (0.22)	-0.639 (0.69)	.354
REED	0.345 (0.90)	.702								
MADRS	-0.743 (10)	<b>&lt;.001</b>		-0.575 (0.13)	-2.705 (63)		<b>&lt;.001</b>	-0.497 (0.12)	-2.340 (0.59)	<b>&lt;.001</b>
RAID-N	-0.360 (0.11)	<b>.002</b>		-0.060 (0.15)	-0.316 (0.77)		.684	-0.144 (0.14)	-0.762 (0.72)	.296
NPI sum	-0.069 (0.04)	.112		0.041 (0.05)	0.525 (61)		.397	0.017 (0.05)	0.221 (0.59)	.711
GMHR	1.986 (0.75)	<b>.013</b>		1.195 (0.76)	0.874 (55)		.119	1.313 (0.73)	0.960 (53)	.076
EQ-VAS	0.129 (0.52)	<b>&lt;.001</b>		0.041 (0.03)	0.745 (57)		1.194	0.026 (0.03)	0.480 (55)	.383
PSMS	-0.334 (0.18)	.073		-0.019 (0.22)	0.059 (0.69)		.932	0.099 (0.21)	0.316 (67)	.637
IADL	-0.102 (0.10)	.334								
FDC characteristics										
Participants per day	1.18 (0.52)	.823								
Employees per day	0.012 (1.42)	.993								
Number of participants per employee	-0.114 (1.17)	.924								
Health educated personnel at the FDC	-0.377 (1.52)	.807								
Time outdoors	3.207 (0.94)	<b>.003</b>						3.409 (0.90)	1.996 (0.53)	<b>.001</b>
ICC = 17%										
$R^2_1$ (level 1)				42.0%				40.0%		
$R^2_2$ (level2)				9.0%				93.0%		

Note: Bold value indicates statistical significance,  $p$ -value < .05. Modell 1 = analysis with only individual variables. Modell 2 = analysis with variables on FDC level.

$R^2_1$  = The proportion of variance at the individual level that was explained by the model.

$R^2_2$  = The proportion of ICC (FDC level) explained by the model.

Abbreviations: CDR, Clinical Dementia Rating scale; EQ-VAS, Euro-QoL Visual Analogue scale; GMHR, General Medical Health scale; IADL, Instrumental Activity of Daily Living; ICC, Intra-Class correlation coefficient; MADRS, Montgomery Asberg Depression Rating Scale; MoCA, The Montreal Cognitive Assessment; NPI, Neuropsychiatric Inventory's questionnaire; OSS-3, Oslo Social support; PSMS, Physical Self-Maintenance Scale; RAID-N, Rating Anxiety in Dementia-Norwegian version; REED, The Anosognosia Rating Scale.

## 5 | DISCUSSION

The present study aimed to describe the people with dementia who attended FDC in Norway and to explore whether the characteristics of the participants and the FDC are associated with their quality of life.

### 5.1 | Characteristics of people with dementia attending FDC

The present study found a higher number of men at FDC compared to regular day care and the participants at FDC were younger and more often lived together with a partner. In addition, they had a higher educational level than those at regular day care (Rokstad et al., 2016). The observations about sex, age and living conditions are in line with a study comparing participants at regular day care and FDC in the Netherlands (de Bruin et al., 2011). A literature review revealed that some men prefer social involvements that support their identity and where they can feel useful (Manthorpe & Moriarty, 2014). Similarly, a study on people with early-onset dementia emphasised that the participants still had the capacity to work with adapted work tasks and that not contributing to society made them feel less meaningful (Johannessen & Möller, 2013). FDC provides a wide range of farm activities that the participants can engage in using their remaining resources and competences, and this participation in adapted farm activity may influence to whom it is offered and who accept this type of day care. The majority of Norwegian FDCs include people with early-onset dementia or dementia in early stage as their main target group (Ibsen et al., 2018). This is reflected in the population of the present study, where most of the participants had mild dementia according to the CDR-SOB score. Further, the high educational level among the participants at FDC may also be related to the over-representativeness of men, whom most often undertook education after primary school until the late 1900s (Falnes-Dalheim, 2004).

Half of the participants in our study had clinically significant neuropsychiatric symptoms. This is slightly lower than the findings from a review by Bergh and Selbæk (2012) that found neuropsychiatric symptoms in the range of 56%-88% of home-dwelling people with dementia. Our finding is also lower than the 65% found in a Dutch population (Borsje et al., 2018). However, Wergeland et al. (2014) found neuropsychiatric symptoms in only 21% of their Norwegian home-dwelling population with dementia.

Psychotropic drugs are related to the prevalence of neuropsychiatric symptoms (Bergh & Selbæk, 2012; Borsje et al., 2018). In the present study, psychotropic drugs are dominated by anti-dementia medication (54.3%) and antidepressants (30.9%). The antidepressant use is higher than in the studies of Wergeland et al. (2014) and Borsje et al. (2018), and a proper explanation of these findings will need more investigation. However, the present study indicates that the population at FDC is quite resourceful and consequently may belong to a group of society that requires the help and medication that they feel is needed. The prevalence of antipsychotics and tranquilisers is

low at 3.7% and 9.9%, respectively, which is in line with Borsje et al. (2018) and lower than in Wergeland et al. (2014). The use of tranquilisers is decreasing in the Norwegian population of older adults over 70 years in general, while the use of painkillers is increasing (Norwegian Institute of Public Health, 2018). Among the FDC participants, the prevalence of painkillers is reported to be almost one-third of what is reported among the older population in Norway.

### 5.2 | Characteristics associated with quality of life

The present study found that the quality of life of people with dementia who attend FDC was associated with the experience of having social support, a low score on depressive symptoms and spending time outdoors at the FDC. In addition, there was a difference in the quality of life among the participants at the different FDC services and most of this variation was related to the time spent outdoors at the FDC.

Our participants had high scores on the subjective quality of life, which is in accordance with the scores of people with dementia who attend regular day care. However, Rokstad et al. (2016) found a significantly higher score in the quality of life of those with shallow or no awareness of memory loss according to the REED. The present study did not find the same association, which may indicate that people with knowledge of their cognitive impairment can experience a good quality of life. This is in accordance with Banerjee et al. (2009), who claim that there does not seem to be any relationship between quality of life and cognition and awareness.

The relationship between quality of life and having social support is in line with earlier research (Wolverson et al., 2016). Also, the association between depressive symptoms and a reduction in quality of life among people with dementia are consistent with a large body of literature (Barca et al., 2015; Conde-Sala et al., 2016; Martyr et al., 2018). This underscores the need for surroundings and care environments that promotes social support and prevent depression. Both physical activity (Cooney et al., 2013; Ohrnbergera, Ficherab, & Suttona, 2017) and spending time in nature (Carver, Lorenzon, Veitch, Macleod, & Sugiyama, 2018; Orr et al., 2016) are claimed to have a positive impact on depressive symptoms. Further, the presence of animals is found to influence positively on mental health (Friedmann et al., 2015; Olsen et al., 2016).

Being physical active, spending time outdoors and being in social interactions with both other people and animals are the core components of the service offered at FDC (de Bruin et al., 2011; Ibsen et al., 2018). The present study underscores the benefit of spending time outdoors, as it was associated with a better quality of life and explained the variation in the quality of life reported by the participants at the FDC level. The activities performed outdoors at Norwegian FDC's consist of walking, plant- and animal-related activities and other types of farm work (Ibsen et al., 2018). From this, one can conclude that the participants are involved in some physical activity. However, spending time outdoors was associated with better quality of life, also when adjusted for the participants' physical health status. This may indicate that just being outdoors, regardless



of the intensity of the physical activity, give a positive influence on the quality of life. The result could occur due to self-selection, where those with a higher quality of life initially were easier to get outdoors. However, our findings correspond with the findings of Beerens et al. (2018), who reported that activities outdoors, though only observing others, contributed to well-being and a better mood in people with dementia.

The findings in the present study do not reveal whether it is the farm context with the interactions and activities performed there or rather the use of antidepressants that affect the low levels of depressive symptoms and a high score in quality of life among the participants. Nevertheless, the present study argues that the care environment at FDC may influence how the participants perceive their quality of life, including their psychological well-being, behavioural competence and the subjective side of the objective environment, as described by Lawton (1994).

Finally, small-scaled dementia care is emphasised as positive for the attendees, referring to smaller groups in a noninstitutional environment (Chaudhury, Cooke, Cowie, & Razaghi, 2018). However, we did not find any association between farm variables, as group size at the farm or variables related to the staff, regarding the attendant's quality of life. This is in line with the finding of Verbeek et al. (2010), investigating the relation between group size and quality of life of residents in small-scaled and regular nursing homes.

## 6 | STRENGTH AND LIMITATIONS

The participants with dementia mainly answered the assessments themselves and this could be seen as a strength. No participants were excluded due to cognitive decline or type of dementia diagnosis. The total population of people with dementia who attend FDC is small and there is a limitation in that those who did not have a next of kin seeing them at least once a week were excluded. Only 25 of the 35 existing farms were able to include participants, thus, the number of participants in the study was lower than anticipated. This may have affected the power of the analysis. However, there was a clear-cut difference between the significant values and those that did not reach significance, except for the GMHR. As we could not collect data on those who did not participate, we do not know whether they differed from those in the study. In addition, the participant group was quite homogeneous. Finally, the fact that a total of ten researchers and assistants did the interviews and filled in the assessment forms together with the person with dementia or their next of kin may have had an impact on the data collection, although all of them had the same internal training and guidelines material.

## 7 | CONCLUSION

The findings of the present study describe that FDC reaches a different target group than regular day care. Thus, FDC is an important

complementary service within dementia care to meet the diversity in the population of people with dementia. This knowledge is essential for health care personal and those developing dementia care in the municipality, adapting services to their care receivers. Time spent outdoors made an important contribution to the participants' quality of life and also on the variation in the quality of life reported at the FDC level. This emphasises that the facilitation of outdoor activity must be prioritised in dementia care, even though the possibilities for physical activities are limited. Further research with a longitudinal perspective is necessary to see how the participants at FDC develop over time.

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## CONFLICT OF INTERESTS

The authors declare that they have no competing interests.

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