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RESEARCH PAPER

Individual and interpersonal factors associated with care-related quality of life in older adults: a comparison of home-based services, nursing homes and sheltered housing

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Abstract

Background: Understanding how long-term care (LTC) services affect care-related quality of life (CRQoL) and potential differences between LTC services is important, especially considering ageing in place policies. However, data on CRQoL is lacking. This study aims to investigate characteristics associated with CRQoL and compare CRQoL across service types.
Methods: From October 2022 to January 2024, older adults in Norway were interviewed using ASCOT (Adult social care outcomes toolkit): 151 in nursing homes, 129 in sheltered housing and 134 in home-based services. Mixed effects models investigated associations between individual-, interpersonal- and care service characteristics and CRQoL, including specific domains.
Results: Age was positively associated with CRQoL, and men had lower cumulative odds of better CRQoL for social participation and control. Cognitive decline was associated with worse CRQoL for safety, social participation and control, while physical decline was associated with better CRQoL for safety. Frequent contact with friends was associated with better CRQoL for activity and social participation, and frequent contact with family was associated with better CRQoL for safety. However, frequent contact with friends was associated with worse CRQoL for safety, and frequent contact with family was associated with worse CRQoL for accommodation cleanliness and dignity. Home-based care recipients had significantly poorer control, safety and activity than sheltered housing residents, and had significantly poorer control than nursing home residents.

Conclusions: The present study revealed significant associations with individual and interpersonal characteristics and clear differences between service types. This information can help target quality improvement strategies toward groups with the lowest CRQoL.

Keywords: care related quality of life; long-term care; home-based services; nursing homes; sheltered housing; older people

Key Points

- Data on care-related quality of life (CRQoL) and the factors that influence it is lacking.
- Frequent social contact was associated with better overall CRQoL, activity, social participation and safety.

- Increased cognitive disability was associated with lower CRQoL, while increased age was associated with higher CRQoL.
- Home-based care recipients had significantly poorer CRQoL for control compared to sheltered housing- and nursing home residents.
- Future efforts should focus on enhancing control over daily life in home-based services.

Introduction

Governments in Western countries are striving to address the growing challenges facing long-term care (LTC) services for older adults, driven by an ageing population and an increasing number of individuals with complex care needs [1, 2]. Coupled with a lack of healthcare personnel and limited finances, policymakers and practitioners must determine the best ways to deliver effective high-quality care services [3, 4]. Ageing in place policy has been presented as a viable direction for sustainable services, by advocating for older adults to live at home for as long as possible to delay or avoid a transfer to a nursing home [5]. While this approach is presented as a sustainable solution and many older adults would prefer to receive care at home [6], data on LTC outcomes and the factors that influence them across different service types are lacking. This limits our ability to compare quality and effectiveness between service types, identify areas for improving practice and better understand how LTC policies influence the quality of life of care recipients.

Given the focus on personalised care, emphasising control and co-creation of services [7], the quality and outcomes of LTC services should be measured from the care recipient's own perspective. Recent efforts to translate the Adult Social Care Outcomes Toolkit (ASCOT) into Norwegian have provided a new opportunity to systematically measure care recipient's subjective experiences of care services in Norway [8–10]. ASCOT is a measure of care related quality of life (CRQoL), encompassing aspects of quality of life that may be affected by care services [11]. ASCOT has been successfully used to understand the CRQoL of care recipients [12] and compare the impact of different LTC services [13].

According to Knapp (1984) and Donabedian (1997), an individual's CRQoL is the result of individual-, interpersonal- and structural care service characteristics [14, 15]. Consequently, observed differences in CRQoL between nursing home residents, sheltered housing residents and home-based care recipients may be due to individual differences between care recipients, differences in available social and informal support, or related to differences in care provision. Ascertaining the strength of the association of these factors with CRQoL provides valuable insights into tailoring quality improvement strategies.

Findings from previous studies have indicated several individual and interpersonal characteristics that influence CRQoL. For example, the disability level of the care recipient is significantly associated with CRQoL, with a general trend that greater disability correlates with poorer CRQoL [13, 16–18]. Sociodemographic factors, such as age, gender and education, influence how individuals perceive their health and well-being [19, 20] and can be expected to correlate with CRQoL. However, studies investigating these associations yield inconsistent results [16, 18, 21, 22]. Social contact and support are core interpersonal factors, and individuals who receive more social support generally report higher CRQoL [22, 23]. Most previous studies investigating associations of individual and interpersonal factors with CRQoL are conducted within one specific LTC service, and potential differences between LTC service types are unknown. The present study aims to investigate the individual and interpersonal characteristics associated with CRQoL in older care recipients from three different LTC services and understand how CRQoL varies by service type.

Methods

This cross-sectional study used ASCOT [8] to investigate the CRQoL of older adults residing in nursing homes or sheltered housing or receiving home-based services. These LTC services consist of both medical care (such as dispensing medication and rehabilitation) and social care (such as assisting with cooking and facilitating social activities). Care in home-based services and sheltered housing is limited to decisions on type and extent of services, whereas nursing homes provide 24-hour support. Home-based care represents the lowest level, sheltered housing an intermediate level, and nursing homes the highest level of care [24]. Service allocation is mainly based on care recipients' functional ability and individual needs [24–26].

Setting and participants

Data were collected in three quite large and central municipalities in Norway from October 2022 to January 2024. We interviewed 471 LTC recipients aged 65 or older. After excluding participants with missing values, the analyses included 414 LTC recipients: 151 in nursing homes, 129 in sheltered housing and 134 in home-based services. These care recipients were clustered within 13 nursing home units, 10 sheltered housing units and 11 zones for home-based services. Exclusion criteria were receiving end-of-life care and receiving LTC for less than two weeks. See Burrell et al. (2025) for more information on setting [10].

Dependent variables

The dependent variables stem from the ASCOT domains (Table 1). The basic domains are *food and drink, personal cleanliness and comfort, accommodation cleanliness and comfort* and *safety*, while the higher order psychosocial domains are *social participation, activity, control over daily life* and *dignity* [11].

Table 1. The ASCOT domains, with domain names according to the Norwegian translation

Domain	Definition
Food and drink	The service user feels he/she has a nutritious, varied and culturally appropriate diet with enough food and drink he/she enjoys at regular and timely intervals
Personal cleanliness and comfort	The service user feels he/she is personally clean and comfortable and looks presentable or, at best, is dressed and groomed in a way that reflects his/her personal preferences
Accommodation cleanliness and comfort	The service user feels their home environment, including all the rooms, is clean and comfortable
Personal safety	The service user feels safe and secure. This means being free from fear of break-ins, abuse, falling or other physical harm
Social participation	The service user is content with their social situation, where social situation is taken to mean the sustenance of meaningful relationships with friends, family and feeling involved or part of a community should this be important to the service user
Activity	The service user is sufficiently occupied in a range of meaningful activities whether it be formal employment, unpaid work, caring for others or leisure activities
Control over daily life	The service user can choose what to do and when to do it, having control over his/her daily life and activities
Dignity	The negative and positive psychological impact of support and care on the service user's personal sense of significance

The ASCOT toolkit consists of different tools, and we used the face-to face four-level interview (INT4) and the care home four-level mixed-methods tool (CH4). The INT4 is a structured interview with trained raters (researchers in the project) and the form was filled out by the rater. The CH4 consists of the same questions, but comprises a multi-faceted data collection for care recipients with difficulty self-reporting [27]. Trained raters set the finale scores based on an adapted conversation with the care recipient, observation of the care recipient and interviews with next-of-kin and staff [27]. To view the ASCOT questions, see https://research.kent.ac.uk/ascot/.

For each domain, care recipients could choose between four response options [11]. In the *ideal state*, needs are met to the desired level, care is personalised and represents the preferred situation. For *no unmet needs*, all needs are adequately met, but not to the desired level. For *some unmet needs*, all needs are not adequately met, while for *high unmet needs*, the unmet needs are so frequent or severe that they have negative health effects [11]. The dependent variable was analysed both as a continuous and categorical variable. When analysed as a continuous variable, the scores for each domain were summed for each individual to produce a *summed score*. Given four response options (scored as 0–3), the summed score could range from 0 to 24. When each domain was analysed as a categorical variable, we combined the two response options indicating unmet needs. This combination yielded larger groups and greater statistical power and highlighted the difference between personalised care (ideal state), satisfactory care (no unmet needs) and inadequate care (unmet needs).

Independent variables

Independent variables included individual-, interpersonal- and care service characteristics. Individual characteristics included age, gender, education (compulsory education, high school, university/college) and physical- and cognitive functioning. Physical and cognitive functioning are based on 18 disability measures evaluated by healthcare personnel [28]. Scores range from 1 (no need for assistance) to 5 (totally dependent on assistance) for each item, which are based on WHOs International Classification of Functioning, Disability and Health [26, 29]. Physical functioning is the mean of the items personal hygiene, dressing, eating, using the toilet, indoor mobility, outdoor mobility, shopping, housekeeping and cooking. Cognitive functioning is the mean of the items memory, communication, daily decision-making, social interaction, behavioural control, attending to finances, attending to health, initiative and experience of safety [26, 30].

Interpersonal characteristics included the frequency of contact with family and friends (daily, weekly, monthly, more seldom). The care service characteristic was LTC service type (nursing homes, sheltered housing, home-based services). We also controlled for the ASCOT tool used (INT4 or CH4) but did not report on this variable.

Statistical analyses

We described care recipients and investigated differences between service types by computing proportions and chi-square tests for categorical variables and mean with standard deviation and ANOVAs for continuous variables.

We performed mixed effects models with a random intercept varying at the unit level to study the associations between the independent variables and CRQoL. This approach is necessary since care recipients are clustered within different nursing home units, sheltered housing units and zones for home-based services (see 'Setting and participants'). Unobserved heterogeneity due to differing unit affiliations, meaning that the CRQoL of care recipients in the same unit is more similar than the CRQoL of care recipients in different units, was accounted for by a random effect for unit affiliation. Bivariate models investigated potential differences between service types, while multivariate models additionally included individual and interpersonal characteristics. To compare all service types to each other, we re-run all mixed effects models, using the exact same variables, but changed the reference category for service type from sheltered housing to nursing homes.

Table 2. Descriptive statistics for care recipients by service type

N (%)[a]	Total N = 414	Nursing homes N = 151	Sheltered housing N = 129	Home-based services N = 134	p
Gender					0.197
female	287 (69.3)	109 (72.2)	93 (72.1)	85 (63.4)	
male	127 (30.7)	42 (27.8)	36 (27.9)	49 (36.6)	
Education					0.049
compulsory education	188 (45.4)	75 (49.7)	64 (49.6)	49 (36.6)	
high school	131 (31.6)	47 (31.1)	41 (31.8)	43 (32.1)	
university or college	95 (22.9)	29 (19.2)	24 (18.6)	42 (31.3)	
Contact with family					0.008
daily	123 (29.7)	35 (23.2)	36 (27.9)	52 (38.8)	
weekly	220 (53.1)	81 (53.6)	67 (51.9)	72 (53.7)	
monthly	46 (11.1)	23 (15.2)	17 (13.2)	6 (4.5)	
more seldom	25 (6.0)	12 (7.9)	9 (7.0)	4 (3.0)	
Contact with friends					<0.001
daily	59 (14.3)	9 (6.0)	25 (19.4)	25 (18.7)	
weekly	117 (28.3)	29 (19.2)	28 (21.7)	60 (44.8)	
monthly	83 (20.0)	33 (21.9)	23 (17.8)	27 (20.1)	
more seldom	155 (37.4)	80 (53.0)	53 (41.1)	22 (16.4)	
Mean (SD) [b]					
Age in years	84.3 (8.2)	84.6 (7.8)	85.9 (8.9)	82.4 (7.5)	0.002
Physical functioning (1 (best) -5 (worst))	2.9 (0.9)	3.5 (0.8)	2.8 (0.7)	2.3 (0.6)	<0.001
Cognitive functioning (1 (best) -5 (worst))	2.5 (0.7)	3.0 (0.7)	2.5 (0.6)	1.9 (0.5)	<0.001

p-value from ANOVA or chi-square test. [a]N (%) for categorical variables. [b]Mean and standard deviation for continuous variables

We used a linear mixed effects model for the summed score and ordinal mixed effects models for each domain, where the dependent variables were the response options. In ordinal models, odds ratios (ORs) refer to the cumulative odds of reporting a higher response option compared to all lower response options combined.

Statistical tests were deemed significant at a 5% significance level. We performed the analyses in R Statistical Software, version 4.4.1 [31] (ordinal package for ordinal mixed effects models, and glmmTMB package for linear mixed effects models).

Ethical considerations

The study received ethical approval from the Regional Committee for Medical and Health Research Ethics in Norway (reference 257661). Healthcare personnel asked care recipients, or next-of-kin if care recipients lacked capacity to consent, to sign the informed consent form. The study is in accordance with the Helsinki Declaration. This work was supported by the Research Council of Norway [number 300654].

Results

Table 2 presents descriptive statistics for the sample of care recipients by service type. While all recipients of home-based services were interviewed with INT4, we used CH4 for 29.8% (N = 45) of nursing home residents and 15.5% (N = 20) of sheltered housing residents. Most care recipients were women, and the majority had compulsory education as their highest education. Home-based care recipients had a significantly higher educational level than residents in nursing homes and sheltered housing and were significantly younger than sheltered housing residents. Nursing home residents had the poorest physical and cognitive functioning, followed by sheltered housing residents, while home-based care recipients had the best functioning. Moreover, home-based care recipients had significantly more contact with family and friends than nursing home- and sheltered housing residents. Nursing home residents had significantly less contact with friends than sheltered housing residents.

Table 3 presents the percentage of care recipients in each response option for each domain by service type, and the bivariate ordinal mixed effects models for each domain. Fewer care recipients had unmet needs for basic domains and dignity, than for the higher order domains social participation, activity and control over daily life. The mean summed score was 18.5 (SD = 3.2) for nursing homes, 19.5 (SD = 3.3) for sheltered housing, and 18.9 (SD = 3.7) for home-based services.

Bivariate mixed effects models

The bivariate linear mixed effects model for the summed score did not find any significant differences between service types (data not shown), while the bivariate ordinal mixed effects models for each domain found several significant differences (Table 3). Home-based care recipients had a significantly better rating of food and drink than nursing home residents, but a significantly poorer rating of accommodation

Table 3. Frequency and percentage of care recipients by outcome state and service type, and the bivariate ordinal mixed effects models for each domain. N for each domain is reported separately due to sporadic item non-response

	Food and drink	Personal cleanliness	Accommodation cleanliness	Safety	Social participation	Activity	Control	Dignity
Nursing homes								
N	151	151	151	151	150	151	151	151
Ideal state	100 (66.2)	104 (68.9)	101 (66.9)	95 (62.9)	47 (31.3)	26 (17.2)	60 (39.7)	97 (64.2)
No unmet needs	45 (29.8)	44 (29.1)	43 (28.5)	49 (32.5)	47 (31.3)	44 (29.1)	50 (33.1)	39 (25.8)
Unmet needs	6 (4.0)	3 (2.0)	7 (4.6)	7 (4.6)	56 (37.3)	81 (53.6)	41 (27.2)	15 (9.9)
Sheltered housing								
N	129	129	129	129	128	129	129	126
Ideal state	90 (69.8)	92 (71.3)	90 (69.8)	90 (69.8)	55 (43.0)	55 (42.6)	60 (46.5)	76 (60.3)
No unmet needs	33 (25.6)	33 (25.6)	35 (27.1)	32 (24.8)	33 (25.8)	32 (24.8)	49 (38.0)	43 (34.1)
Unmet needs	6 (4.7)	4 (3.1)	4 (3.1)	7 (5.4)	40 (31.3)	42 (32.6)	20 (15.5)	7 (5.6)
Home-based services								
N	133	134	134	134	134	133	134	133
Ideal state	109 (82.0)	98 (73.1)	74 (55.2)	78 (58.2)	54 (40.3)	51 (38.3)	52 (38.8)	83 (62.4)
No unmet needs	20 (15.0)	29 (21.6)	48 (35.8)	46 (34.3)	38 (28.4)	25 (18.8)	38 (28.4)	42 (31.6)
Unmet needs	4 (3.0)	7 (5.2)	12 (9.0)	10 (7.5)	42 (31.3)	57 (42.9)	44 (32.8)	8 (6.0)
Bivariate ordinal mixed effects models								
Service type (ref: sheltered housing): OR (95% CI)								
home-based services	2.19 (0.98; 4.92)	1.06 (0.57; 1.95)	0.52 (0.34; 0.81)†	0.61 (0.37; 1.03)	0.97 (0.57; 1.65)	0.80 (0.45; 1.41)	0.56 (0.33; 0.94)*	1.06 (0.58; 1.95)
nursing homes	0.95 (0.46; 1.96)	0.95 (0.53; 1.70)	0.97 (0.97; 0.97)‡	0.77 (0.47; 1.26)	0.70 (0.42; 1.17)	0.41 (0.24; 0.70)‡	0.65 (0.40; 1.07)	1.03 (0.57; 1.85)
Service type (ref: nursing homes): OR (95% CI)								
sheltered housing	1.05 (0.51; 2.17)	1.06 (0.59; 1.90)	1.03 (0.55; 1.91)	1.30 (0.79; 2.15)	1.42 (0.86; 2.37)	2.46 (1.43; 4.23)‡	1.53 (0.93; 2.51)	0.97 (0.54; 1.76)
home-based services	2.31 (1.05; 5.09)*	1.12 (0.62; 2.03)	0.54 (0.29; 0.99)*	0.80 (0.50; 1.29)	1.38 (0.83; 2.30)	1.96 (1.14; 3.37)*	0.85 (0.52; 1.41)	1.03 (0.57; 1.89)

* $P < .05$, † $P < .01$, ‡ $P < .001$

Table 4. The multivariate linear mixed effects model for the summed score

	Summed score	
	Estimate (95% CI)	p
Service type (ref: sheltered housing)		
home-based services	−1.06 (−2.10; −0.03)	0.045
nursing homes	−0.04 (−1.05; 0.98)	0.942
Age	0.08 (0.04; 0.12)	<0.001
Gender (ref: female)		
Male	−0.46 (−1.16; 0.23)	0.188
Education (ref: compulsory)		
high school	0.45 (−0.27; 1.17)	0.219
university or college	−0.60 (−1.43; 0.23)	0.157
Physical functioning	0.30 (−0.36; 0.96)	0.375
Cognitive functioning	−1.33 (−2.16; −0.51)	0.002
Contact w/family (ref: daily)		
weekly	−0.03 (−0.77; 0.71)	0.941
monthly	−0.11 (−1.26; 1.03)	0.848
more seldom	−1.52 (−2.96; −0.09)	0.038
Contact w/friends (ref: daily)		
weekly	−0.37 (−1.38; −0.64)	0.471
monthly	−1.99 (−3.09; −0.89)	<0.001
more seldom	−1.16 (−2.21; −0.12)	0.029

cleanliness and comfort than nursing home- and sheltered housing residents. Nursing home residents also had a significantly poorer rating of accommodation cleanliness and comfort than sheltered housing residents. Home-based care recipients and sheltered housing residents had significantly better ratings of activity than nursing home residents, and home-based care recipients had significantly poorer ratings of control over daily life compared to sheltered housing residents.

Multivariate mixed effects models

The linear mixed effects model for the summed score is presented in Table 4, while the ordinal mixed effects models are presented in Table 5. When controlling for individual- and interpersonal characteristics, home-based care recipients had significantly lower summed scores than sheltered housing residents. Moreover, home-based care recipients had significantly lower odds of having better CRQoL for safety, activity and control over daily life compared to sheltered housing residents. Home-based care recipients also had significantly lower odds of having better CRQoL for control over daily life compared to nursing home residents (OR = 0.37, 95% CI = 0.20–0.70, $P = .002$).

There was a significant positive association between age and the summed score and several domains, meaning that CRQoL increased as care recipients aged. Specifically, care recipients had 3–4% higher cumulative odds of reporting better CRQoL for personal cleanliness and comfort, accommodation cleanliness and comfort, safety, social participation and control over daily life for every year they aged. Men had significantly lower cumulative odds of reporting better CRQoL for social participation and control over daily life compared to women. No significant associations with education appeared.

Significant negative associations between cognitive functioning and the summed score and several domains showed that, as cognitive functioning declined, care recipients had lower cumulative odds of having better CRQoL for safety, social participation and control over daily life. On the contrary, a significant positive association for physical functioning showed that, as physical functioning declined, care recipients had higher odds of reporting better CRQoL for safety. Evidently, cognitive decline is associated with worse CRQoL for safety, social participation and control over daily life, while physical decline is associated with better CRQoL for safety.

Less frequent contact with family and friends was associated with significantly poorer CRQoL (summed score). However, differences between specific domains emerged. Significant negative associations are evident between activity, social participation and frequency of contact with friends, and between safety and frequency of contact with family, showing that more contact was associated with better CRQoL for these domains. Significant positive associations are evident between dignity and accommodation cleanliness and frequency of contact with family, and between safety and frequency of contact with friends, showing that more contact was associated with worse CRQoL for these domains.

We performed sensitivity analyses where the linear mixed effects model for the summed score only included care recipients interviewed with the INT4, or did not include ASCOT tool as predictor (see Appendix 1 and 2 in the Supplementary Material). These analyses found the same results as above.

Discussion

The aim of the present study was to investigate the individual and interpersonal characteristics associated with CRQoL and understand how CRQoL varies by service type. This is important given that CRQoL is an internationally validated measure of how well LTC services are meeting people's care-related needs [32–35], and has been associated with both care quality and effectiveness in the UK [36–38]. Results showed significant associations between CRQoL and physical and cognitive functioning, age, gender and social contact. Furthermore, home-based care recipients had significantly poorer control over daily life, activity and safety compared to sheltered housing residents and significantly poorer control over daily life compared to nursing home residents after controlling for individual- and interpersonal characteristics. The present study supports the theoretical concepts of Knapp (1984) and Donabedian (1997), who argue that the outcomes of care, including the quality of life of care recipients, arise from multiple interacting factors at the individual-, interpersonal- and structural levels.

Table 5. The multivariate ordinal mixed effects models for each domain (ORs refer to the cumulative odds of reporting a higher response option compared to all lower response options combined)

	Food and drink		Personal cleanliness		Accommodation cleanliness		Safety	
a) Basic domains	**OR (95% CI)**	**p**	**OR (95% CI)**	**p**	**OR (95% CI)**	**p**	**OR (95% CI)**	**p**
Service type (ref: sheltered housing)								
home-based services	1.80 (0.75;4.35)	0.189	0.85 (0.42;1.71)	0.652	0.66 (0.36;1.21)	0.181	0.50 (0.28;0.88)	0.017
nursing homes	1.15 (0.51;2.60)	0.728	1.35 (0.67;2.71)	0.399	0.86 (0.46;1.61)	0.644	0.94 (0.54;1.65)	0.834
Age	1.02 (0.99;1.05)	0.227	1.03 (1.00;1.06)	0.033	1.04 (1.01;1.07)	0.007	1.04 (1.01;1.07)	0.007
Gender (ref: female)								
male	0.79 (0.47;1.32)	0.362	0.99 (0.60;1.63)	0.970	1.61 (0.99;2.60)	0.054	0.80 (0.50;1.27)	0.337
Education (ref: compulsory)								
high school	1.10 (0.63;1.91)	0.739	1.08 (0.64;1.84)	0.777	0.87 (0.54;1.42)	0.585	1.31 (0.80;2.14)	0.283
university or college	0.79 (0.42;1.46)	0.451	0.68 (0.38;1.22)	0.193	0.81 (0.46;1.42)	0.454	0.96 (0.55;1.65)	0.876
Physical functioning	1.08 (0.65;1.78)	0.765	1.25 (0.77;2.02)	0.375	1.09 (0.71;1.69)	0.693	1.61 (1.03;2.52)	0.037
Cognitive functioning	0.61 (0.33;1.14)	0.123	0.63 (0.35;1.16)	0.136	0.84 (0.49;1.46)	0.545	0.46 (0.26;0.81)	0.007
Contact w/family (ref: daily)								
weekly	0.77 (0.43;1.39)	0.388	1.64 (0.96;2.81)	0.071	1.43 (0.89;2.30)	0.144	0.83 (0.51;1.37)	0.471
monthly	0.52 (0.22;1.19)	0.120	1.42 (0.61;3.26)	0.414	2.31 (1.00;5.35)	0.049	1.32 (0.57;3.02)	0.515
more seldom	0.60 (0.21;1.68)	0.329	0.52 (0.20;1.35)	0.178	3.69 (1.21;11.28)	0.022	0.39 (0.15;0.98)	0.044
Contact w/friends (ref: daily)								
weekly	1.29 (0.58;2.87)	0.532	1.10 (0.50;2.39)	0.814	0.85 (0.43;1.67)	0.631	1.52 (0.79;2.92)	0.211
monthly	0.88 (0.38;2.03)	0.771	0.48 (0.21;1.08)	0.077	0.49 (0.23;1.03)	0.059	1.13 (0.56;2.31)	0.728
more seldom	1.00 (0.46;2.14)	0.992	0.73 (0.33;1.60)	0.430	0.70 (0.34;1.44)	0.335	2.22 (1.11;4.45)	0.025
	Social participation		**Activity**		**Control over daily life**		**Dignity**	
b) Higher order domains	**OR (95% CI)**	**p**	**OR (95% CI)**	**p**	**OR (95% CI)**	**p**	**OR (95% CI)**	**p**
Service type (ref: sheltered housing)								
home-based services	0.70 (0.40;1.24)	0.228	0.54 (0.30;0.97)	0.038	0.40 (0.23;0.70)	0.001	1.15 (0.57;2.32)	0.699
nursing homes	1.07 (0.62;1.84)	0.809	0.57 (0.33;1.00)	0.051	1.09 (0.65;1.82)	0.747	1.04 (0.52;2.10)	0.905
Age	1.03 (1.00;1.05)	0.041	1.02 (0.99;1.04)	0.224	1.03 (1.01;1.06)	0.018	1.02 (0.99;1.05)	0.129
Gender (ref: female)								
male	0.59 (0.38;0.91)	0.016	0.74 (0.48;1.14)	0.167	0.65 (0.43;0.99)	0.047	0.97 (0.61;1.54)	0.896
Education (ref: compulsory)								
high school	0.89 (0.57;1.39)	0.616	1.37 (0.88;2.13)	0.160	1.20 (0.77;1.87)	0.414	1.37 (0.84;2.23)	0.214
university or college	0.64 (0.39;1.06)	0.086	0.98 (0.58;1.64)	0.928	0.67 (0.41;1.10)	0.117	0.86 (0.50;1.50)	0.604
Physical functioning	1.32 (0.89;1.97)	0.169	0.77 (0.52;1.15)	0.208	1.03 (0.70;1.51)	0.899	1.41 (0.88;2.27)	0.158
Cognitive functioning	0.52 (0.31;0.85)	0.010	0.77 (0.46;1.30)	0.327	0.53 (0.32;0.87)	0.012	0.83 (0.39;1.24)	0.223
Contact w/family (ref: daily)								
weekly	1.06 (0.67;1.67)	0.804	0.97 (0.62;1.53)	0.910	0.89 (0.57;1.38)	0.597	0.83 (0.50;1.36)	0.457
monthly	0.75 (0.37;1.51)	0.420	0.57 (0.27;1.20)	0.137	0.95 (0.48;1.90)	0.888	2.69 (1.08;6.68)	0.033
more seldom	0.46 (0.19;1.11)	0.085	0.49 (0.20;1.19)	0.115	0.74 (0.30;1.78)	0.497	0.49 (0.19;1.26)	0.141
Contact w/friends (ref: daily)								
weekly	0.66 (0.35;1.25)	0.203	0.66 (0.35;1.23)	0.192	0.83 (0.44;1.55)	0.556	0.83 (0.41;1.67)	0.598
monthly	0.23 (0.12;0.46)	<0.001	0.31 (0.15;0.61)	<0.001	0.54 (0.28;1.08)	0.080	0.62 (0.29;1.33)	0.221
more seldom	0.27 (0.14;0.52)	<0.001	0.41 (0.21;0.78)	0.007	0.71 (0.37;1.35)	0.295	0.65 (0.32;1.33)	0.238

Associations with individual and interpersonal characteristics

The positive association between CRQoL and age aligns with previous UK findings [13], whereas other studies have not reported significant associations [16, 18, 21]. We suggest that older care recipients may experience longer disease courses, higher acceptance of their dependency, and greater adaptation to formal care, contributing to better CRQoL [39]. Furthermore, increased cognitive disability was associated with lower CRQoL, consistent with previous studies [17, 18, 40]. Cognitive impairment can hinder communication, making it harder to express needs and interact with others [41]. It may also reduce autonomy, leading to feelings of disenfranchisement [42]. Considered alongside the weaker association with physical functioning, the findings suggest that LTC services may be more effective at compensating for physical than cognitive decline. This is clinically important given the rising prevalence of dementia and increased demand for LTC services.

Frequent social contact was associated with better overall CRQoL, activity, social participation and safety—aligning with previous research [22, 23, 43, 44]. Care providers can

hence increase LTC recipients' CRQoL by providing and facilitating social contact. Interestingly, more family contact was associated with poorer CRQoL for accommodation cleanliness and comfort and dignity. The reasons for this are unclear but may reflect a heightened contrast between previous informal care and current institutionalised accommodation and professionalised care, evoking a sense of loss or disempowerment.

Differences in CRQoL between service types

Bivariate and multivariate models revealed significant differences between service types in some basic domains, but the percentages in Table 3 show that care recipients generally rated these domains positively. However, it is concerning that approximately one third of home-based care recipients reported unmet needs for control over daily life (Table 3) and experienced significantly poorer control compared to sheltered housing- and nursing home residents—findings consistent across both bivariate and multivariate analyses. Poorer control over daily life among home-based care recipients has also been reported in a UK study [13], but this finding may not be generalizable to countries where LTC services are organised in markedly different ways.

The relatively poorer control over daily life in home-based services likely stems from several interconnected factors, including long and unpredictable waiting times, frequent changes in carers and lack of control over who enters the home [13]. Care is less accessible compared to residential care, and homes may not be accommodated to individual needs [17]. Additionally, home-dwelling care recipients may have higher expectations due to being earlier in their disease course. Further research is needed to clarify these causes. The poorer control over daily life in home-based care is concerning given the emphasis on ageing in place policies, which highlight independence and control [5, 45]. This study suggests that additional measures are needed to support home-dwelling older adults if ageing in place is to remain a sustainable LTC policy.

Strengths and limitations

This study is the first to compare CRQoL across three LTC service types in Norway. Data were collected simultaneously, by the same researchers, in the same municipalities and for the same purpose, as opposed to previous ASCOT studies that have often pooled data from different studies to compare scores [13, 16, 46].

A major strength of the ASCOT tool is its ability to include care recipients with cognitive impairment through the CH4 approach. However, this method is unsuitable for home-based services, limiting generalisability to cognitively impaired individuals in this group. Moreover, generalisability to smaller or more rural municipalities is uncertain, since data were collected in larger and more central municipalities. Although healthcare personnel were urged to invite all care recipients, we cannot guarantee that recruitment was entirely non-selective.

Conclusions

This study revealed that home-based care recipients had poorer control over daily life compared to residents of nursing homes and sheltered housing. Significant associations with age, gender, physical and cognitive functioning and contact with family and friends also emerged. This information can aid in developing tailored interventions to accommodate specific groups of care recipients in different LTC settings. Future efforts can focus on enhancing control over daily life in home-based services, especially considering recent ageing in place policies.

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Author contribution as follows: Sogstad, Veenstra and Towers developed the overall research project. Towers developed the ASCOT methodology. All authors contributed to the conceptualisation and design of the study. Burrell and Sogstad acquired the data material. Burrell performed the analyses. All authors interpreted the data results, and the article was written by Burrell. All authors critically revised the article and approved the final manuscript. Sogstad was the project manager.

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