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RESEARCH PAPER

Measuring quality of life in care homes when self-report is challenging: the construct validity, structural characteristics and internal consistency of the mixed-methods adult social care outcomes toolkit

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Abstract

Introduction: The adult social care outcomes toolkit (ASCOT) measures social care-related quality of life (SCRQoL) using self-completion questionnaires and interviews. Many care home residents find such methods inaccessible, leading to a reliance on proxy-reporting. This study aimed to establish the psychometric properties of the mixed-methods toolkit [ASCOT-Care Homes, 4 outcome (CH4)] for measuring SCRQoL when residents cannot self-report.

Methods: Two cross-sectional, mixed-methods studies were undertaken in care homes for older people in England between 2015 and 2020. We used the ASCOT-CH4 (observation, and interviews with residents and proxies) to collect information about SCRQoL and collected additional data on residents' needs and characteristics, and variables hypothesised to be related to SCRQoL.Hypothesis testing was applied to establish construct validity, Cronbach's alpha for internal consistency and exploratory factor analysis for structural validity.

Results: The combined dataset included 475 residents from 54 care homes (34 nursing, 20 residential). Half had a diagnosis of dementia. Less than a third of residents were able to complete an ASCOT interview. Observations and proxy interviews informed researcher ratings, meaning there were no missing ASCOT-CH4 scores. ASCOT-CH4 was found to be a weak unidimensional scale, consistent with other ASCOT measures, with acceptable internal consistency ($\alpha = 0.77$, 8 items). Construct validity was supported by the findings.

Conclusions: The ASCOT-CH4 is an alternative to conventional proxy-questionnaires for measuring the SCRQoL of care home residents, with good psychometric properties. A limitation is that users need a range of data collection skills. Future research should explore whether findings are replicable when data are collected by other researchers.

Keywords: adult social care outcomes toolkit (ASCOT), quality of life, care homes, nursing homes, mixed-methods, older people

Key Points

- Quality of life is internationally recognised as an important outcome of long-term care.
- Most care home residents cannot complete self-completion questionnaires or interviews.
- Proxy-report questionnaires measure the views of staff or family on residents' quality of life, but do not directly consider residents' experience.

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- The Adult Social Care Outcomes Toolkit—Care Homes, 4 outcome (ASCOT-CH4) is an alternative to conventional proxy-questionnaires, enabling residents to participate in a meaningful way, whilst minimising missing information.
- The tool has good psychometric properties.

Introduction

Background

A total of ∼425,000 older people live in care homes in England because they require 24-h, onsite, care and support due to long-term health problems and/or cognitive impairment [1]. Care is delivered by a largely social care workforce of skilled (but unregistered) care workers. A total of ∼40% of care homes for older people have registered nurses onsite (nursing homes) [2]. The importance of measuring and improving the quality of life of people living in care homes is highlighted in English social care policy [3, 4] and considered at least as relevant as health outcomes to residents and family members [5, 6]. However, unlike a lot of health data, quality of life data is not routinely collected [7]. Although many instruments exist for measuring different aspects and constructs of quality of life in older age [8], few were developed and tested with care home residents or designed to be sensitive to the impact of social care services and settings, and most rely on self-report [8]. Due to high levels of cognitive impairment and dementia in care homes, most residents are unable to complete questionnaires and have difficulty with structured interviews [9, 10]. Thus, capturing residents' quality of life in a quantifiable way, which can be used to improve and benchmark quality, is challenging [11].

ASCOT

The Adult Social Care Outcomes Toolkit (ASCOT) [12] is a preference-weighted measure of social care-related quality of life (SCRQoL). SCRQoL refers to the aspects of quality of life most affected by social care services and support. There are eight domains of SCRQoL: Control over daily life, Personal cleanliness and comfort, Food and Drink, Personal safety, Social participation and involvement, Occupation, Accommodation cleanliness and comfort and Dignity (described here: https://www.pssru.ac.uk/ascot/domains/). Originally designed as a self-completion questionnaire (SCT4) or interview (INT4) with older people receiving social care in their own homes [12], each domain has one question with four response options, reflecting four outcome states (ideal state, no unmet needs, some unmet needs and high unmet needs).

Three scores can be derived from the ASCOT interview version (INT4) (available here: https://www.pssru.ac.uk/ascot/wp-content/uploads/2021/05/ASCOT-INT4.pdf): *current SCRQoL*, *expected SCRQoL* and *SCRQoL gain*. In care homes, *current SCRQoL* captures the resident's situation now (e.g. living in the care home). *Expected SCRQoL* self-estimates the counterfactual, i.e. what their SCRQoL would be like, if they did not receive any care or support. By subtracting *expected SCRQoL* from *current SCRQoL*, it is possible to estimate the impact of care service(s): *SCRQoL gain = current SCRQoL—expected SCRQoL* [13].

Research with a wide range of adults using social care, including older people, adults with physical or sensory disabilities, intellectual disabilities and/or autism, has established the validity, structural characteristics and reliability of the self-completion tools, both in original English language and translated versions [14–19]. *Expected SCRQoL* is an indicator of a person's underlying social care need, which is highly correlated with functional ability [12, 13]. However, the structured interview format and, in particular, the *expected SCRQoL* questions are also not suitable for people with limited or low cognition [13], meaning an alternative method is required for the care home population.

The mixed-methods approach

The ASCOT-CH4 (Care Homes, 4 outcome states, herein referred to as CH4) was designed to overcome the methodological barriers to self-report in this population [20]. It is designed primarily for research and evaluation (other methods are available for routine use [21, 22]) and aims to include residents' views and experiences, so that scores are not solely based on proxy report. Trained individuals (referred to as 'raters') gather evidence about residents' SCRQoL from different sources; observations of daily life, resident interviews (adapted to the cognitive and communication needs of the resident), and proxy interviews with staff (one per resident) and family (where possible). These sources of evidence inform ratings of residents' SCRQoL. Detailed accounts of the approach are described elsewhere [9, 23].

Previous research has found excellent levels of inter-rater reliability [23, 24] and demonstrated that the approach is both feasible and necessary if researchers want to include residents' perspectives in research [9]. For example, the larger study, from which this analysis has drawn, found that ∼60% of residents were able to give their views in a flexibly-administered qualitative interview, but <25% could choose a response option using a structured interview questionnaire [9]. In line with previous research [25], the study also found that care workers over-estimated residents' SCRQoL [9]. Disagreement between staff and raters varied between 27 and 56% for each domain, with staff usually rating residents' SCRQoL one outcome state higher (e.g. 'ideal' to 'no needs') [9]. The mixed-methods approach allows a way of including and considering residents' experiences in the final SCRQoL ratings, through the evidence collected in qualitative interviews and observations.

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However, given the significant differences in the methodologies between the ASCOT self-report (SCT4) and the mixed-methods tool (CH4), it is important to establish the structural characteristics, internal consistency and construct validity of ASCOT-CH4 SCRQoL. Feasibility has been reported elsewhere [9] but this is the first time that the psychometric properties of the CH4 have been explored.

Aims and objectives

The aim of this study was to establish the structural characteristics, internal consistency and construct validity of ASCOT-CH4 in a sample of older care home residents in England.

Methods

The analysis draws on data collected in two cross-sectional studies. The first is the Measuring Outcomes of Care Homes (MOOCH) project, funded by the National Institute for Health and Care Research (NIHR) School for Social Care Research (2015–2019) and granted ethical approval by the National Social Care Research Ethics Committee (15-IEC08_0061) [24, 26]. The second is the Measuring and Improving Care Home Quality study (MICare HQ), funded by the NIHR Health and Social Care Delivery Research (HSDR) programme (2017–2020), and granted ethical approval by the Health Research Authority (18/LO/0657) [9]. Both studies used the same methods of data collection, including the ASCOT-CH4.

Participants

Data were collected from 475 residents in 54 care homes for older adults (30 of which were nursing homes) across two studies. Inclusion criteria for both studies were: permanent residents of care homes on the Care Quality Commission (CQC) register in participating authorities in South East England, which offered care to those aged >65 years and/or living with dementia. Exclusion criteria was limited to temporary/short stay residents and those receiving palliative care.

Study one recruited 293 residents from 34 care homes (20 nursing) in two English local authorities (LAs). Eligible residents were randomly selected from an alphabetical list and invited to take part in the research. This approach was repeated until a sample of 5–10 residents per home was achieved (described in detail elsewhere [24]). Data collection took place between June and December 2017.

Study two recruited 182 residents from 20 care homes (10 nursing) in four English LAs. Informed by previous experience (Study One) that recruitment rates were likely to be low, all eligible residents were invited to take part, as described in detail elsewhere [9]). Data collection took place between June and December 2019.

Informed consent was obtained from participants in both studies. In accordance with the Mental Capacity Act [27], residents lacking the capacity to consent were only included if a personal consultee (e.g. family member) advised us that they would like to participate. Consent was viewed as a continuous process, taking into consideration advice from staff and consultees. Before beginning observations or interviews, researchers explained the study and checked the resident's willingness to participate [9].

Data collection

All data collection was paper based.

Resident data

SCRQoL. Data were collected by the research team about all participating residents using the ASCOT-CH4. ASCOT is a preference-weighted measure and ratings for each domain are weighted to reflect English population preferences, to calculate a score ranging from 1 to -0.17 [12]. Scores of one represent optimum or 'ideal' SCRQoL and scores of zero indicate a state that is equivalent, according to the preferences exhibited by the general population, to being dead. Negative scores indicate a state worse than being dead [12].

User Characteristic Questionnaire. Staff completed a User Characteristic Questionnaire about each participating resident, including demographic, weekly fees and detail of how they were funded (e.g. local authority funded, self-funded or with the resident 'topping up').

Ability to perform Activities of Daily Living (ADLs) were collected for the following eight day-to-day tasks: grooming, toileting, feeding, transfers, mobility, dressing, bathing and use of stairs. Each item was scored as zero for 'independent' and one if the resident could complete the task 'with help' or 'significant help'. An ADL count was calculated for each resident from zero to eight, the sum score of each item, with a lower score indicating greater ability to complete daily tasks independently.

Cognitive impairment was measured using the Minimum Dataset Cognitive Performance Scale (MDS CPS) [28]. The MDS CPS comprises five questions: dementia diagnosis, short term memory problems, cognitive skills, ability to communicate and whether the person is able to eat and drink independently [28]. An overall score can be calculated from zero to six. A score of six indicates severe cognitive impairment; the lower the score, the more intact cognition is.

Health-related quality of life was measured using the EQ-5D-5L proxy version 1 [29]. The measure captures five health attributes: mobility, self-care, usual activities, pain/discomfort and anxiety/depression. Responses for each item are converted into a preference weighted score and summed into an index score. In line with latest guidance, the EQ-5D-5L values were mapped to the EQ-5D-3L value sets [30]. Index scores can range from <0, where 0 indicates a health state

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Table 1. Hypotheses for the construct validity analysis

Variables	Expected associations
ADL dependency	Based on similar studies [15, 18] and an a priori hypothesis, we expected a weak-to-moderate negative association between ADL dependency (which is an indicator of need for social care) and the *expected* and *current* SCRQoL scores, with a stronger relationship between ADL dependency and SCRQoL *expected* than for SCRQoL *current*. This is because the *current* SCRQoL score takes into account the compensatory action of care on QoL, whereas *expected* SCRQoL is an estimation of underlying social care outcome need (without care).
MDS CPS	Based on an priori hypothesis that cognitive performance is a good indicator of underlying social care need, we hypothesised a weak-to-moderate negative association for the SCRQoL scores, which (as above) would be stronger for the *expected* compared to the *current* SCRQoL score. This would be less marked for the *current* SCRQoL score due to the compensatory effect of care on QoL outcomes, compared to *expected* SCRQoL (estimated QoL without care).
EQ-5D	We expected that there would be a weak-to-moderate positive association between the EQ5D index and SCRQoL score. This is because the EQ-5D-5L is a measure of a related construct to SCRQoL, i.e. *health-related quality of life* [19]. Again, we anticipated that this would be stronger for the SCRQoL *expected* than the SCRQoL *current* score. Previous research, involving those over 65 in the community, found that EQ5D pain and mobility were weakly correlated with ASCOT self-completion version, but there were moderate correlations for EQ5D anxiety and depression, self-care and usual activities [15]. We hypothesised that this would also be the case for the EQ5D items and ASCOT CH4 SCRQoL, and also that there would be stronger correlations with expected SCRQoL (estimated QoL without care) across all five domains.

equivalent to death (negative values is equivalent to worse than death), and 1 indicates full health.

Statistical analysis

All analyses were conducted in STATA, version 16.

Sample descriptives for Study 1 and Study 2 were calculated and reported for each study sample, and also the combined sample. All other analyses, including the descriptive statistics of SCRQoL and the distribution of SCRQoL ratings for each domain, were conducted and reported for the combined sample.

Structural validity

For comparability with previous research, structural validity of SCRQoL (*current* and *expected*) was assessed by exploratory factor analysis (EFA). The ASCOT-CH4 was expected to fit to a single factor, in line with other ASCOT measures [12, 16].

Since the eight ASCOT-CH4 items (one per domain) are ordinal variables, polychoric correlations [31] were calculated using the user-written command, *polychoric* [32], and principal factor EFA was conducted on the polychoric correlation matrix (i.e. ordinal EFA). The Kaiser-Meyer-Olkin (KMO) measure was applied to verify the sampling adequacy [33, 34] and Bartlett's test of sphericity to evaluate whether the correlations between items were adequate for factor analysis [35]. The number of factors (components) to retain was guided by Horn's parallel analysis using principal component analysis (PCA) [36–38], conducted with the user-written command, *paran* [39]. Retention of factors was informed by the criteria of (i) adjusted Eigenvalues >1.0 and (ii) the observed exceeded random principal component Eigenvalues, where randomly-generated Eigenvalues were calculated in 5,000 random correlation matrixes for analysis, using 95th percentile [40] Factors were retained if two or more items loaded onto the factor with a factor loading of ≥0.4 [41].

Internal consistency

The internal consistency of SCRQoL (*current* and *expected)* was evaluated using Cronbach's alpha coefficient, where a coefficient of ≥0.70 is deemed an acceptable level of internal consistency [42].

Construct validity

Construct validity was assessed by hypothesis testing using Spearman rank correlation. Hypotheses based on direction and strength of association were developed using previous studies and experience/a priori reasoning (see Table 1). Correlation coefficients were interpreted as weak (<0.3), moderate (0.3–0.5) or strong (>0.5) [43]. We applied the COSMIN criterion of 75% of hypotheses accepted to demonstrate adequate construct validity [44].

Results

Sample characteristics for Study One and Study Two, individually and combined, can be seen in Table 2.

Ratings of *current SCRQoL* by domain for the combined study sample are shown in Supplementary Figure 1. Reflecting the methodology, by which raters used all available evidence, there were no missing data. For six domains (items), ratings used all of the four available options (i.e. the ideal state, no unmet needs, some unmet needs and high unmet needs). The domains (items) *Dignity,* and *Accommodation comfort and cleanliness*, however, had no cases rated as high unmet needs. The distribution of responses varied by domain (item), with a higher proportion of ratings of high unmet needs for the higher-order domains of *Occupation* (8.8%), *Control over daily life* (3.2%) and *Social participation* (2.5%)

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Table 2. Sample characteristics

Variable	Categories	Study 1 (*n* = 293) Frequency (%)	Study 2 (*n* = 182) Frequency (%)	Combined (*n* = 475) Frequency (%)
Sex	Male	96 (32.8%)	58 (31.9%)	154 (32.4%)
	Female	197 (67.2%)	121 (66.5%)	318 (67.0%)
	Missing data	0 (0.0%)	3 (1.6%)	3 (0.6%)
Age group	50–59 years	3 (1.0%)	4 (2.2%)	7 (1.5%)
	60–69 years	16 (5.5%)	10 (5.5%)	26 (5.5%)
	70–79 years	41 (14.0%)	34 (18.7%)	75 (15.8%)
	80–89 years	130 (44.4%)	78 (42.9%)	208 (43.8%)
	≥90 years	84 (28.7%)	52 (28.5%)	136 (28.6%)
	Missing data	19 (6.5%)	4 (2.2%)	23 (4.8%)
Had a diagnosis of dementia?	No	123 (42.0%)	89 (48.9%)	212 (44.6%)
	Yes	152 (51.9%)	87 (47.8%)	239 (50.3%)
	Missing data	18 (6.1%)	6 (3.3%)	24 (5.1%)
Capacity to consent to research?	No	88 (30.0%)	61 (33.5%)	149 (31.4%)
	Yes	205 (70.0%)	117 (64.3%)	322 (67.8%)
	Missing data	0 (0.0%)	4 (2.2%)	4 (0.8%)
Is the resident publicly-funded?	Yes, fully	111 (37.9%)	49 (26.9%)	160 (33.7%)
	Yes, partially	22 (7.5%)	22 (12.1%)	44 (9.3%)
	No, self-funded	111 (37.9%)	88 (48.4%)	199 (41.9%)
	Missing data	49 (16.6%)	23 (12.6%)	72 (15.2%)
Residential home CQC rating	Requires improvement	93 (31.7%)	25 (13.7%)	118 (24.8%)
	Good	182 (62.1%)	132 (72.5%)	314 (66.1%)
	Outstanding	18 (6.1%)	25 (13.7%)	43 (9.1%)
Nursing or residential	Nursing	190 (64.8%)	98 (53.8%)	288 (60.6%)
	Residential	103 (35.2%)	84 (46.2%)	187 (39.4%)
Variable		MOOCH (*n* = 293) Mean (SD, N)	MiCare (*n* = 182) Mean (SD, N)	Combined (*n* = 475) Mean (SD, N)
ASCOT CH4 Index score	Current SCRQoL	0.77 (0.16, 293)	0.74 (0.18, 182)	0.76 (0.17, 475)
	Expected SCRQoL	0.10 (0.21, 293)	0.11 (0.20, 182)	0.10 (0.20, 475)
	SCRQoL gain	0.67 (0.21, 293)	0.63 (0.19, 182)	0.65 (0.21, 475)
EQ-5D-5L Index score		0.34 (0.37, 272)	0.46 (0.38, 177)	0.39 (0.37, 449)
EQ-5D mobility[a]		2.79 (1.51, 275)	3.19 (1.61, 182)	2.95 (1.56, 457)
EQ-5D self-care[a]		2.63 (1.47, 275)	2.94 (1.49, 182)	2.75 (1.48, 457)
EQ-5D usual activities[a]		2.81 (1.50, 274)	3.47 (1.49, 182)	3.08 (1.53, 456)
EQ-5D pain[a]		4.00 (0.88, 275)	4.28 (0.89, 178)	4.11 (0.89, 453)
EQ-5D anxiety/depression[a]		4.00 (1.09, 273)	4.27 (0.98, 180)	4.11 (1.05, 453)
ADL count[b]		4.60 (2.72, 271)	5.32 (2.60, 171)	4.88 (2.69, 442)
MDS CPS		1.89 (1.94, 264)	2.09 (1.92, 175)	1.97 (1.93, 439)

[a] **EQ-5D-5L items:** These were rated as: not/no problems (5), slightly/slight problems (4), moderately/moderate problems (3), severely/severe problems (2) or extremely/extreme problems (1). [b] **ADL count:** The number of ADLs that the respondent was unable to complete alone, without difficulty. Eight ADLs were considered, i.e. get up/down stairs; go outdoors; get about indoors; get in/out of bed; use the toilet; wash hands and face; bathe; get dressed and undressed and feed him or herself.

than for the basic care-related domains and *Dignity* (<1%). This is consistent with findings of previous research [23, 24].

Supplementary Figure 2 shows the rating of expected QoL for each domain. This represents the *expected SCRQoL* for each attribute in the absence of care and support. It is an indicator of the person's underlying social care need. Again, there were no missing data. The level of underlying social care need, without care and support, was at either some or high unmet needs, ranging from 88.0% (*Control over daily life, Personal comfort and cleanliness*) to 95.8% (*Food and drink*) of the sample. Only 1–4% of the sample were expected to be in the ideal state without care and support.

The distributions of the CH4 SCRQoL are shown in Supplementary Figures 3a and b. The distribution of *current* SCRQoL is negatively skewed with a mean of 0.75 (*standard deviation* 0.17; *range* 0.24–1.00; *kurtosis* 2.53; *skewness* −0.53). With expected SCRQoL, 23.0% of the samples were rated at the worst possible SCRQoL. The distribution is positively skewed with a mean of 0.10 (*standard deviation* 0.20; *range* −0.09 to 0.93; *kurtosis* 5.09; *skewness* 1.41).

Exploratory factor analysis

The exploratory factor analysis is summarised in Table 3. The KMO measure (KMO = 0.82, 0.89) verified the sampling adequacy for *current* and *expected* SCRQoL, respectively. Bartlett's test of sphericity ($\chi^2(28) = 801.37$, $P < 0.001$, $\chi^2(21) = 1{,}170.59$, $P < 0.001$) also indicated that correlations between items were adequate. Horn's parallel analysis

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Table 3. Exploratory factor analysis

	Current SCRQoL		Expected SCRQoL	
	Unrotated factor loadings	Uniqueness	Unrotated factor loadings	Uniqueness
Food & drink	0.44	**0.81**	0.89	0.21
Accommodation	0.55	**0.70**	0.93	0.14
Personal comfort & cleanliness	0.66	0.57	0.89	0.21
Social participation	0.69	0.52	0.55	**0.69**
Occupation	0.79	0.37	0.66	0.56
Control over daily life	0.73	0.46	0.88	0.23
Personal safety	0.52	**0.73**	0.83	0.31
Dignity	0.48	**0.76**	n/a	n/a

Items with uniqueness ≥0.60 shown in **bold**.

Table 4. Spearman rank correlations and results of hypothesis testing for construct validity

	Current SCRQoL	Hypothesis Accepted?	Expected SCRQoL	Hypothesis Accepted?
EQ-5D-5L index	0.221**	Yes	0.525**	Yes
Mobility	0.140**	Yes	0.434**	Yes
Self-care	0.270**	No	0.587**	Yes
Usual activities	0.213**	No	0.488**	Yes
Pain	<0.001	No	0.125*	Yes
Anxiety and depression	0.100*	No	0.164**	Yes
ADL count	-0.283**	Yes	-0.603**	Yes
MDS CPS	-0.322**	Yes	-0.496**	Yes

** $P < 0.01$, * $P < 0.05$.

confirmed a single factor solution for both *current* and *expected*. EFA using principal factors had a first component with an Eigenvalue of 3.1 (*current*) or 4.64 (*expected*), which explained 100% of the variance, with subsequent Eigenvalues <0.3 for both measures. All items loaded onto a single factor (≥0.40, see Table 3). Unique variances were high for all items, with very high unique variance (≥0.60) for four of the eight SCRQoL (*current*) items. This is similar to the self-completion ASCOT-SCT4 (*current*) [12], which had a single-factor structure with high unique variance. For *expected* SCRQoL, only social participation had high unique variance (≥0.60).

Internal consistency

Both ASCOT-CH4 SCRQoL measures were found to have acceptable internal consistency (*current*: $\alpha = 0.77$, 8 items; *expected*: $\alpha = 0.88$, 7 items).

Construct validity

Results from the construct validity analysis by hypothesis testing are summarised in Table 4.

Overall, there is good evidence (i.e. ≥75% of overall hypotheses accepted [44]) of the construct validity of the CH4 toolkit. The results support all hypotheses for *expected* SCRQoL. EQ-5D, ADL count and MDS CPS may be conceptualised as indicators of underlying need for social care support, either in terms of the person's underlying health-related quality of life, ability to complete activities of daily living or cognitive impairment. Therefore, in each case we would expect the association between *expected SCRQoL* (i.e. the person's quality of life without social care, which reflects the person's underlying social care need), to be stronger than for the corresponding association with *current* SCRQoL, which is what was observed in each case (see Table 3).

For *current* SCRQoL the hypothesised associations between ADL count and cognitive impairment (MDS CPS) were found, with worse SCRQoL being associated with higher levels of dependency and cognitive impairment. However although the hypothesised association between the EQ-5D index score and *current* SCRQoL was observed, we did not observe the expected significant associations with some of the individual EQ-5D items. First, the associations between *current* SCRQoL and EQ-5D self-care and usual activities were weak, rather than moderate. Second, the hypothesised weak significant association between EQ-5D pain item score and *current* SCRQoL was not observed; this association was only observed for *expected* SCRQoL. Finally, the significant relationship between *current* SCRQoL and the EQ5D anxiety and depression item was weak, not moderate as hypothesised based on previous research [15].

Discussion

This study sought to evaluate the construct validity, internal consistency and factor structure of the mixed-methods ASCOT-CH4, which is designed to measure the SCRQoL (*current, expected*) of care home residents, including those who cannot self-report. The feasibility and justification of

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the mixed-methods approach in this population is reported elsewhere [9].

In line with previous research using the self-completion measure (current) [12, 14, 15], ASCOT-CH4 SCRQoL (*current*) was found to have a single factor structure with high uniqueness, acceptable internal consistency ($\alpha = 0.77$, 8 items). A single factor structure and good internal consistency ($\alpha = 0.88$, 7 items) was also found for *expected* SCRQoL. The construct validity of the ASCOT-CH4 (*current, expected*) was supported since the majority (12 out of 16, or 75%) of our hypotheses were accepted [15]. However, there were some exceptions, relating to the hypothesised *strength* of associations (three out of sixteen hypotheses) or any association at all (one of sixteen hypotheses) with *current* SCRQoL. These hypotheses were based on previous research conducted with adults receiving social care in their own homes. *Current* SCRQoL takes into account the compensatory action of social care to maintain a person's quality of life. It may be that 24-h, onsite, care and support in care homes mitigates somewhat against the negative impact of poor functioning (self-care and usual activities), anxiety and depression on SCRQoL, compared with the time-limited visits associated with traditional domiciliary care models. Care homes are able to offer higher levels of psycho-social support (staff, other residents and visitors) and help is on-hand throughout the day. Care homes have regular medication rounds and staff are on-site to support or encourage residents to take pain medication, as required, whereas in their own homes people may be alone for long periods allowing symptoms to go unmanaged for longer. However, previous research indicates that pain may be under-recognised and managed in care homes (see, [9] for a review), so this explanation warrants further investigation.

Limitations

A limitation of this research is that the data was collected only in care homes in the South East of England and by members of the ASCOT team, who developed the mixed-methods approach. The ASCOT-CH4 relies on a range of data collection skills, including observation, which require training. Future research should explore whether these findings are replicable with residents who have different socioeconomic and demographic profiles and when the data is collected by researchers outside of the ASCOT team. Future work should also explore the test–retest reliability of CH4 ratings and compare *expected SCRQoL* with other methods of estimating impact.

Conclusion

Quality of life is an important outcome of care but conventional self-report methods are not uniformly appropriate for older people living in care homes. Previous research has established that ASCOT-CH4 offers a feasible and appropriate methodology for measuring the SCRQoL of older people living in care home and adds value to purely proxy-report methodologies [9]. This paper outlines evidence of the psychometric proprieties of the ASCOT-CH4, as consistent with other ASCOT tools [12, 16], indicating that it is a valid and reliable measure of older adult care home residents' SCRQoL.

Supplementary Data: Supplementary data mentioned in the text are available to subscribers in *Age and Ageing* online.

Declaration of Conflicts of Interest: None.

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Data Availability Statement: The data reported in this article cannot be shared publicly because the University of Kent, who holds the data, does not have permission from study participants or ethical approval to share this more widely.

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