

# Quality of life data in older adults: self-assessment vs interview

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## Abstract

**Background and purpose:** There are obstacles for older people when reporting quality of life (QoL) in a survey format. The aim of this study was to explore the quality of data obtained on self-assessed QoL among older people with respect to modes of administration. **Method and results:** Approximately half of the QoL items showed significantly higher mean values in the mail sample than in the interview sample. Data suggest that there may be more vulnerability towards offering socially desirable answers. Problems with reduced energy and loss of memory affect both modes of administration. **Conclusions:** This study demonstrates that investigating the mode of questionnaire administration among older people can be a valuable means by which to detect possible threats to data quality when interpreting QoL scores.

**Key words:** Data collection ■ Questionnaires ■ Surveys ■ Interviews  
■ Quality of life ■ Aged 80 and over

This study explored similarities and differences in data quality with respect to self-assessed quality of life (QoL). There are many potential obstacles for older people when answering QoL questionnaires in a survey format, such as reduced energy, cognitive problems, including memory loss, and frailty (Emami et al, 2010; Cassar and Baldacchino, 2012). The literature describes how older people, especially those with physical and mental health comorbidities, continue to be unjustifiably excluded from clinical trials (Crome, 2012). This raises the question of how nurses can plan research that uses understandable QoL questionnaires and ways of administration that reduce possible hindrances for older adults. It has been suggested that QoL in older people should be assessed from a broad perspective that focuses on health, functional status, family relationships, social contacts, daily living activities, feelings of security, psychological symptoms, thoughts

regarding a meaningful past and future, and changes due to aging (Bowling et al, 2003; Kalfoss, 2010). Nursing researchers emphasise the importance of assessing QoL (Drageset et al, 2012; King and Hinds, 2012). Such a comprehensive assessment of QoL demands the inclusion of several questions, which can increase respondent burden and pose challenges both physically and cognitively (Birren and Schaie, 2006; Fayers and Machin, 2007). For example, specific items regarding intimacy or death and dying have been shown to be cognitively and psychologically demanding for survey participants (Chachamovich et al, 2006). Consequently, potential threats to data quality must be considered when interpreting study results (Groves et al, 2009).

## Background

According to Bowling (2005: 281), there are four steps involved in answering questionnaires either by post or interviews:

‘comprehension of the question, recall of requested information from memory, evaluation of the link between the retrieved information and the question, and the communication of the response’.

For example, memory problems and loss of energy which sometimes occur in older

people (Birren and Schaie, 2006), might complicate the answering process in surveys. Other factors affecting survey results and data quality include procedure characteristics, such as the method of contacting the respondents, questionnaire guidelines and the introduction to specific questions. Two usual modes of administration among older adults include interview or self-assessment where interviews have been previously described as the least burdensome (Bowling, 2005). However, interviews face-to-face or by telephone are less discreet than self-administration by mail, and anonymity is more difficult to obtain (Moum, 1998; Reddy et al, 2006). There is also some evidence that respondents prefer to complete sensitive questions themselves rather than be asked them by an interviewer (Groves et al, 2009). Interviews also result in a greater financial burden than postal surveys due to the greater number of hours required to conduct an interview (Greenlaw and Brown-Welty, 2009). Even minor changes in question wording, question order or response format can influence data quality (Bowling and Windsor, 2008). For example, in personal interviews, an untrained interviewer might read or explain the questions in different ways to the respondents, and in the self-administration modes, the respondents may answer the questions in a different order from that stipulated the guidelines stipulate. Consequently, both questionnaires via mail or interviews may pose potential threats to data quality, may bias responses, and may affect the generalisability of the findings.

## Conceptual framework

De Leeuw and van der Zouwen (1988) have proposed two main threats to data quality, which they describe as non-measurement and measurement errors. Non-measurement errors include errors related to sampling coverage (such as recruitment of respondents), overall response rate and item response rate. In one assessment of health among older people, missing data were reported for almost all dimensions (Mallinson, 1998). Fayers and Machin (2007: 387) claimed that 0.5% to

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2% of values will be missing from postal questionnaires and stated that:

**'particular note should be taken if missing data tend to concern particular items on the QoL instrument or occur with a certain type of patient'**

A greater frequency of missing items (non-response) are generally reported in postal surveys compared with interviews (Fayers and Machin, 2007). However, some studies have found no differences in outcomes between self-administered and interview-administered questionnaires (Ankri et al, 2003). High item response has been described as one of the advantages of interview surveys (Polit and Beck, 2012) with a meta-analysis also confirming higher item responses by interview (De Leeuw and van der Zouwen, 1988). In interpreting this meta-analysis, the authors explained that this result may be due to the interviewers motivating the respondent to respond, as well as the increased control afforded by the interviewing, which ensures that all questions are answered and responses are recorded correctly. Measurement error can also be affected by the social setting, social desirability bias and 'yes-saying' (Moum, 1987; 1998). Social desirability is defined as the desire of respondents to present themselves in the best possible light and often occurs in personal interviews. Because interviews involve social interaction between the respondent and the interviewer, this can lead to respondents taking social norms into account when responding (Groves et al, 2009).

When measuring QoL, measurements are recommended to be psychometric-tested (Fayers and Machin, 2007). For example, a study reported that QoL in older people can be measured reliably with the WHOQOL-Bref items (von Steinbüchel et al, 2006). Further, measurement error can also be related to ceiling and floor effects, which have been noted in studies of general and ill samples of older adults. O'Mahony and colleagues (1998) discovered both ceiling and floor effects for various domains of the SF 36. Also, Faria et al (2011) found ceiling effects for all domains in the Nottingham Health Profile. In another study, researchers using the Barthel Index found that a quarter of the older patients displayed ceiling effects (de Morton et al, 2007). Such ceiling effects might also be related to social desirability tendencies.

In summary, modes of administration can have varied effects on data quality, affecting the generalisability of results. With this in mind,

the overall aim of this study was to explore similarities and differences in data quality with respect to self-assessed questionnaires, which were sent to participants via post, versus interviews with older people. The authors were specifically interested in exploring frequency distributions such as ceiling and floor effects, QoL scores, distribution of mean scores, missing responses, and additionally memory and energy related to the mode of survey administration.

## Method

### Sample and procedure

The data for this study were obtained from a secondary analysis of data obtained from a population survey with two sub-samples (interview and a postal questionnaire assessed at the same time). In collaboration with Statistic Norway (SN), the proportion of elderly persons aged 60 years and over living in major geographic regions was reviewed with reference to both age and gender within these regions. A randomized stratified sample was then drawn from SN. Municipalities were contacted with the aim of obtaining updated lists of older people receiving community home care nursing. From these lists, stratified samples were obtained from each municipality with respect to age (ranging from 60 to 90 years), gender, community home care nursing recipient status, and municipality size. The selected sample obtained from this stratification was recruited to participate in the study by postal or personal interview assessment. Only those receiving community home care nursing were personally interviewed. In this study, community home care nursing is defined as those receiving nursing care in their homes and within extended care facilities.

Because very few of the randomised municipalities agreed to participate in the interview study, additional proportional samples were geographically drawn by SN using the same criteria in respect to age, gender, community care and size of municipality. SN had responsibility for study administration in both sub-samples. Municipalities were responsible for organising their own interviewing teams, while SN was responsible for training interviewers based on formalised guidelines. Interviewers received payments of €32 per interview. SN drew a sample of 802 elderly for the postal survey, of which 47 (5.9%) had unknown addresses, were living abroad, or had died. The questionnaires were sent to 755 elderly people living at home. After one reminder, 23 participants (3%) returned the questionnaires stating that they did not want to participate or were too sick to

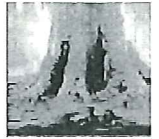
answer. The final response rate was 401 (53%) for those participating in the postal survey. For the sample participating in the interviews (n=89), no record was kept of those persons who were asked but refused to take part in the study. Questionnaire packets included study information, informed consent forms, sociodemographic questions, WHOQOL-Old, WHOQOL-Bref, and various assessments of psychological distress and health. This article will discuss modes of survey administration with respect to frequency of item responses at the QoL scale scores, sensitive items, demographic characteristics, and items about memory and energy.

During questionnaire administration, the respondents in both sub-samples were encouraged to take a break to conserve energy. To avoid inappropriate breaks, which could interfere with the sequence of questioning, the researcher indicated in the text where breaks were recommended.

### Measurements

The WHOQOL-Old module consists of six facets (containing four items each): Sensory Abilities, Autonomy, Past Present and Future Activities, Social Participation, Death and Dying (Cronbach's alpha, range 0.72–0.80) (Power et al, 2005; WHOQOL-Old Group, 2005). Two single items belonging to another QoL instrument used in the study (the WHOQOL-Bref) were used in the statistical analyses. These two were a question on overall QoL ('How would you rate your quality of life?') and a question regarding overall health ('How satisfied are you with your health?') (WHOQOL Group, 1996; Hanestad et al, 2004). Responses on all these items are scored on a Likert scale from 1 (not at all/very dissatisfied/very poor) to 5 (extremely/completely/very satisfied/very good), with response categories covering 'how much' 'how available', 'have enough' or 'how satisfied' the person felt in the previous 2 weeks (Skevington et al, 2004; WHOQOL-Old Group, 2005). Single items were also used to assess the respondents' energy level ('During the last two weeks have you felt less energy and feel that you are functioning more slowly than usual?') and memory ('Do you remember less now than you did a year ago?'). Various sociodemographic variables, including age, gender, marital status, education and living arrangements, health conditions affecting QoL and community home care nursing, were also assessed.

The study was approved by the Norwegian National Ethical Committee on Medical Research.



### Statistical analysis

Descriptive statistics for the WHOQOL-Old module items, including means, standard deviations and score ranges and sample characteristics, were determined. Ceiling and floor effects were explored using frequency distributions. These statistical methods have been reported in other WHOQOL Group publications (Leung et al, 2005; Power et al, 2005; Winkler et al, 2006). The distribution of the QoL items was investigated using the Kolomogrov-Smirnov test. Multiple regression analyses were used to explore statistical associations based on the mode of administration and other variables. Multiple regression analysis was performed to determine which WHOQOL-Old components best predicted overall QoL and health satisfaction in both the sub-samples. Sample size calculation for the present study indicated that in detecting a significant difference at 0.05 significance level with a power of 80% and one of 60%, a sample

of 80 completed interviews were needed, along with 160 completed postal questionnaires.

Data were analysed according to the WHOQOL Group recommendations (WHOQOL Group, 1996; WHOQOL Group, 2005). Analysis was carried out using the SPSS statistical package (version 17.0.2, SPSS Inc, Chicago, IL). The internal consistency of the WHOQOL-Old facets was assessed using Cronbach's alpha ( $\alpha$ ).

### Results

As shown in *Table 1*, significant differences between the sub-samples were seen for all characteristics with the exception of education and energy. *Table 2* also shows that the interview sample (N=89) displayed significantly lower overall health.

When the mean scores were considered on the QoL assessments, they were generally higher in the self-assessed group (N=401), with the exception of the WHOQOL-Old

facets Death and Dying and Intimacy, and nine items on the WHOQOL-Old. The mean scores in Overall QoL (self-assessed: 3.99; interview: 3.53) and overall health satisfaction (self-assessed: 3.74; interview: 2.78) were significantly higher in the self-assessed sample. Also, three of the six WHOQOL-Old facets (Sensory Abilities, Past Present and Future Activities and Social Participation) were significantly higher in the self-assessed sample, with the largest percentage differences occurring in the Social Participation facet (8%) and the lowest difference in the Sensory Abilities facet (5%). The facet Death and Dying (self-assessed: mean score=14.37, 72%; interview: mean score=16.05, 80%) was significantly higher in the interview sample. The facets Autonomy and Intimacy did not show significant differences in the two sub-samples. Almost half of the WHOQOL-Old items (13) showed significantly higher mean values in the self-assessed sample. The highest

Table 1. Characteristics of the two sub-samples

Characteristics	Self-assessed (n=401)		Interview (n=89)		95% CI* / $\chi^2$ value	p-value†
	N (%)	Missing	N (%)	Missing		
<b>Age</b>						p<0.001
Mean (years)	75.1	8 (2.0)	78.6	0	-5.31 to -1.66	
Range (years)	60-91		61-90			
<b>Gender</b>		8 (2.0)		0	9.49, df=1	p=0.002
Male	176 (45)		24 (27)			
Female	217 (55)		65 (73)			
<b>Marital status</b>		14 (3.5)		0	32.67, df=1	p<0.001
With partner	238 (62)		25 (28)			
Without partner	149 (39)		64 (72)			
<b>Education</b>		19 (2.5)		3 (3.4)	3.74, df=2	p=0.154
Basic	242 (62)		61 (71)			
Higher	149 (39)		25 (29)			
<b>Living arrangements</b>		10 (2.5)		0	61.28, df=1	p<0.001
Living at home	389 (98)		73 (82)			
Living in an institution	2 (1)		16 (18)			
<b>Community help on regular basis</b>		12 (3.0)		11 (12.0)	220.20, df=2	p<0.001
Yes	66 (17)		62 (79)			
No	323 (83)		16 (21)			
<b>Health conditions affecting QoL</b>		21 (5.2)		3 (3.4)	35.30, df=1	p<0.001
Yes	184 (48)		72 (84)			
No	196 (52)		14 (16)			
<b>Memory problems</b>		16 (4)		2 (2.2)	5.86, df=1	p=0.016
Yes	246 (63)		67 (77)			
No	142 (37)		20 (23)			
<b>Less energy than 12 months ago</b>		13 (3.2)		2 (2.2)	2.50, df=1	p=0.114
Yes	173 (45)		31 (36)			
No	212 (55)		56 (64)			

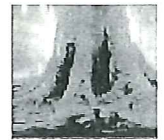
\* CI, confidence interval for differences between self-assessed sample and interview sample

† p level, Student's t-test for differences between self-assessed sample and interview sample

**Table 2. Mean floor and ceiling values for QoL (Overall QoL, WHOQOL-Old facets and items) and health variables based on administration mode**

Item and facet (response range 1–5)	Self-assessed sample (N=490)					Interview sample (N=89)				
	Mean (% of max score)	SD	Missing N (%)	Floor % with '1'	Ceiling % with '5'	Mean (% of max score)	SD	Missing N (%)	Floor % with '1'	Ceiling % with '5'
Overall QoL <sup>†</sup>	3.99(80)	0.03	13 (3.2)	0.2	18.7	3.53(71)	0.09	2 (2.2)	1.1	7.9
Satisfaction with health <sup>†</sup>	3.74(75)	0.05	13 (3.2)	2	16.5	2.78(56)	0.12	2 (2.2)	13.5	4.5
<b>WHOQOL-Old facet: Sensory Abilities<sup>†</sup></b>	<b>16.44(82)</b>	<b>2.94</b>				<b>15.38 (76)</b>	<b>3.68</b>			
Impairments to senses affect daily life <sup>† ‡</sup>	4.07(81)	0.95	13 (3.2)	1.5	40.4	3.76(75)	1.20	0	4.5	36.0
Rate sensory functioning <sup>†</sup>	3.85(77)	0.82	13 (3.2)	0.5	19.1	3.48(70)	0.89	0	1.1	7.9
Loss of sensory abilities affect participation in activities <sup>† ‡</sup>	4.28(86)	0.87	15 (3.7)	1.0	49.9	3.88(78)	1.18	0	4.5	39.3
Problems with sensory functioning affect ability to interact	4.24(85)	0.85	10 (2.5)	0.5	47.4	4.27(85)	1.04	0	0.5	47.4
Cronbach's alpha	α=0.85					α=0.87				
<b>Autonomy</b>	<b>14.67(73)<sup>§</sup></b>	<b>2.90</b>				<b>14.52(73)<sup>  </sup></b>	<b>2.82</b>			
Freedom to make own decisions <sup>†</sup>	3.82(76)	0.93	13 (3.2)	3.8	21.4	4.21(84)	0.78	0	0	21.4
Feel in control of your future <sup>†</sup>	3.47(70)	0.91	11 (2.7)	3.3	10.6	3.19(64)	1.04	3 (3.4)	3.3	10.6
Able to do things you'd like to <sup>†</sup>	3.61(72)	1.01	4 (1)	4	18.9	3.15(63)	1.14	0	4	18.9
People around you are respectful of your freedom <sup>†</sup>	3.72(74)	0.90	18 (4.5)	3.5	13.6	3.97(79)	0.84	2 (2.2)	0	30.3
Cronbach's alpha	α=0.79					α=0.74				
<b>Past, Present and Future Activities</b>	<b>14.67(73)</b>	<b>2.30</b>				<b>13.76(69)</b>	<b>2.60</b>			
Happy with things to look forward to <sup>†</sup>	3.70(74)	0.76	12 (3)	1.3	10.1	3.34(67)	0.87	2 (2.2)	2.2	4.5
Satisfied with opportunities to continue achieving	3.37(67)	0.97	11 (2.7)	4.5	10.3	2.90(58)	1.12	0	10.1	7.9
Received the recognition you deserve in life	3.59(72)	0.81	16 (4)	0	12.6	3.57(71)	0.90	0	2.2	13.5
Satisfied with what you've achieved in life <sup>†</sup>	3.95(79)	0.67	9 (2.2)	0.3	16.9	3.90(78)	0.62	1 (1.1)	0	11.2
Cronbach's alpha	α=0.69					α=0.69				
<b>Social Participation<sup>†</sup></b>	<b>15.07(75)</b>	<b>2.54</b>				<b>13.10(66)</b>	<b>3.27</b>			
Satisfied with the way you use your time <sup>†</sup>	3.86(77)	0.73	9 (2.2)	0.8	15.0	3.49(70)	0.91	0	6.7	2.2
Satisfied with level of activity <sup>†</sup>	3.69(74)	0.84	10 (2.5)	1.3	11.9	2.90(58)	1.00	0	6.7	2.2
Have enough to do each day <sup>†</sup>	3.94(79)	0.8	8 (2)	0.8	27.7	3.63(73)	1.00	1 (1.1)	4.5	15.7
Satisfied with opportunity to participate in community <sup>†</sup>	3.55(71)	0.82	9 (2.2)	1	8.6	3.04(61)	1.13	0	9	9
Cronbach's alpha	α=0.79					α=0.82				
<b>Death and Dying<sup>†</sup></b>	<b>14.37(72)</b>	<b>3.50</b>				<b>16.05(80)</b>	<b>3.43</b>			
Concerned about the way you will die <sup>† ‡</sup>	3.73(75)	1.02	8 (2)	2.5	27.6	4.16(83)	0.94	0	0	47.2

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Afraid of not being able to control death <sup>† ‡</sup>	3.80(76)	1.03	16 (4)	2.3	30.4	4.09(82)	0.99	4 (4.5)	0	44.9
Scared of dying <sup>† ‡</sup>	3.76(75)	1.00	11 (2.7)	1.8	28.9	4.34(87)	0.89	0	1.1	56.2
Fear pain before death <sup>† ‡</sup>	3.05(61)	1.14	15 (3.7)	8.9	12.4	3.40(68)	1.30	0	9	27
Cronbach's alpha	$\alpha=0.86$					$\alpha=0.83$				
<b>Intimacy</b>	<b>15.75(79)**</b>	<b>2.61</b>				<b>15.79(79)††</b>	<b>2.93</b>			
Feel a sense of companionship in life	3.78(76)	0.75	7 (1.7)	0.3	14.4	3.85(77)	0.82	0	2.2	16.9
Experience love in your life	3.71(74)	0.90	25 (6.2)	2.3	17.4	3.56(71)	1.06	3 (3.4)	7.9	12.4
Opportunities to love	4.14(83)	0.76	20 (2)	1	33	4.21(84)	0.82	3 (3.4)	1.1	39.3
Opportunities to be loved	4.07(81)	0.80	16 (4)	0.8	30.5	4.14(83)	0.82	4 (4.5)	1.1	36.0
Cronbach's alpha	$\alpha=0.86$					$\alpha=0.84$				

\* Single item from WHOQOL-Bref

† Significant differences by mean value between the two samples,  $p \leq 0.05$

‡ Recoded negatively worded items in the WHOQOL-Old  
§(73.35), ¶(72.60), \*\* (78.75), ††(78.95)

difference was 16% (Satisfied with level of activity) and the lowest was 1% (Satisfied with what you've achieved in life). Four of the WHOQOL-Old items (all belonging to the facet Death and Dying) showed significantly higher mean values in the interview sample with the highest percentage difference at 12% (Scared of dying) and the lowest difference at 6% (Afraid of not being able to control death). Seven items belonging to the facets Intimacy (4 items), Past Present and Future Activities (2 items) and Sensory Abilities (1 item) did not show any significant differences between the sub-samples.

There were very few missing responses in either sub-samples. Missing responses in the QoL measurements of the self-assessed sample ranged from 1–6.2% (19 items with missing responses over 2%). The most frequent missing responses were related to the following items: 'Experiencing love in your life' (6.2%) followed by 'People around you are respectful of your freedom' (4.5%), 'You receive the recognition you deserve' (4%) 'Afraid of not being able to control death' (4%), and 'Experience opportunities to be loved' (4%). Further, 5.2% of missing responses were related to the question regarding the presence of health conditions affecting one's QoL and 4% missing responses concerned problems with memory. In the interview sample, missing answers ranged from 0 to 4.5% (9 items with missing responses over 2%). The most frequent missing responses were 'Afraid of not being able to control death', 'Opportunities to be loved' (4.5%), 'Experience love in your life' (3.4%), 'Opportunities to love' (3.4%) and

'Feeling in control of your future' (3.4%) as the items most frequently missing. Most of the missing responses belonged to the Intimacy facet in both sub-samples, together with items from Death and Dying in the self-assessed sample and items assessing Autonomy in the interview sample. There were also 12% missing responses in the interview sample in regards to the item receiving community help on a regular basis.

Ceiling effects have been defined as occurring when more than 50% of the respondents report on the highest value of the response scale (Trompenaars et al, 2005). One item (Scared of dying) had a ceiling effect among the interviewed respondents. Also, floor effects (lowest value on the response scale) occurred only in the interview group and included the following five items belonging to the Autonomy (2), Death and Dying (1) and Intimacy (1) facets (Freedom to make own decisions, People around you are respectful of your freedom, Satisfied with what you've achieved in life, Concerned about the way you will die, and Afraid of not being able to control death). As is common in QoL research using Likert scales (Fayers and Machin, 2007), the sample distribution in this study was not normally distributed, as evidenced by the Kolomogorov-Smirnov test, which was significant for all of the items (not displayed in these results).

As shown in Table 3, three separate multiple regression analyses were done to explore statistical associations based on the mode of administration and other variables. By adjusting for sociodemographic variables (i.e.

age, gender, marital status and education) in model 1, the authors found that reduced energy made the strongest contribution to overall QoL in both administration methods (self-assessed: unstandardised coefficient  $B=0.33$ , standardised coefficient  $\beta=0.36$ ,  $p=0.00$ , explaining 18% of the variance; interview:  $B=0.26$ ,  $\beta=0.29$ ,  $p=0.01$ , explaining 11% of the variance). By using the same adjustments in model 2, reduced memory was shown to make a significant contribution in the interview sample only (self-assessed:  $B=0.33$ ,  $\beta=0.36$ ,  $p=0.75$ , explaining 3% of the variance; interview  $B=0.26$ ,  $\beta=0.29$ ,  $p=0.03$ , explaining 9% of the variance). By using the same adjustments in model 3 with the independent variables memory and energy, reduced energy made the most significant contribution in both sub-samples (self-assessed:  $B=-0.35$ ,  $\beta=-0.38$ ,  $p<0.01$ , explaining 17% of the variance; interview sample:  $B=0.21$ ,  $\beta=0.24$ ,  $p=0.05$ , explaining 14% of the variance). Gender and education made significant contributions in all three models among the self-assessed sample.

### Discussion

The aim of this study was to explore similarities and differences in data quality with respect to self-assessed questionnaires via postal mail versus interviews among older people aged 60 years and over. Specifically, the authors explored frequency distributions such as ceiling and floor effects, QoL scores, distribution of mean scores, missing responses, as well as memory and energy related to the mode of survey administration. The preceding analyses were done to demonstrate that the

mode of questionnaire administration may represent a valuable means by which to detect possible threats to data quality regarding questionnaires assessing QoL. Although significant differences in the sub-samples need to be considered when interpreting these results, the general findings can be summarized as follows. First, the mean scores for the QoL items and facets were, for the most part, generally higher in the self-assessed sample, with the exception of the two facets Death and Dying and Intimacy. Second, there were fewer missing answers in the interview sample regarding the assessment of QoL. Third, floor and ceiling effects were found in the interview sample, together with one item displaying floor effects in the self-assessed sample. Fourth, the results raise questions as to whether those interviewed are more vulnerable to social desirability effects and to sensitive items assessing QoL. Lastly, problems with reduced energy and loss of memory may have affected the mode of administration in assessing QoL in both sub-groups.

The significant differences in the mean scores between the sub-samples were consistent with the literature. Research suggests that women, non-partnered people,

those in need of formal help and the number of health problems reported, are all factors associated with lower QoL among older people (Andersson et al, 2006; Paskulin et al, 2009). On the other hand, one can ask if the tendency towards significant differences in sample characteristics (gender, marital status, living arrangements, dependence on community home care nursing, presence of health conditions and memory problems) may explain differences in reduced QoL in the sub-samples (Egger et al, 2001). Research has reported that mail surveys yield higher rates of those reporting good health as compared with interview surveys (Picavet, 2001). However, Picavet (2001) reported that those most ill and with the lowest education were equally represented in both administration methods. On the contrary, method of administration (personal interviews, telephone interviews or self-administered) was found to not have any substantial influence for adults reporting the effects of oral QoL (Reissmann et al, 2011).

#### Missing responses

A major advantage of interviewing is the possibility of collecting good-quality data

with fewer missing responses (Bowling, 2005), but it is more time- and cost-consuming than self-assessment by postal surveys. On the other hand, problems with missing data have been detected as occurring more often in the administration of paper questionnaires (Polit and Beck, 2012). For example, Streiner and Norman (2003) found that among returned paper questionnaires, 5–10% of items were reported as unusable because of omitted, illegible or invalid responses. In another study, it was shown that missing responses affected all dimensions of QoL in a postal administration of older people (Mallinson, 1998). Fayers and Machin (2007) also suggest that particular note should be taken if 0.5% to 2% of the values on QoL items from postal questionnaires are missing. Consequently, one can question whether the 17 items where more than 2% of missing responses occurred in the self-assessed sample require further validation. On the other hand, the fewer missing item responses found in the interview group might reflect interviewer characteristics—i.e. were due to probing and support given when respondents needed help in interpreting items, as found by others (Bowling, 2005). Even sensitive items in the Death and Dying and Intimacy

**Table 3. Multiple regression analyses with energy and memory as the independent variables and QoL as the dependent variable, adjusting for sociodemographic variables.**

		Overall QoL							
		Self-assessed sample (n=401)				Interview sample (n=89)			
		B	95% CI for regression coefficient	$\beta$	t	B	95% CI for regression coefficient	$\beta$	t
Model 1:	Gender	0.140	-0.01–0.28	0.11	2.04*	0.01	-0.44–0.46	0.01	0.05
	Age	0.01	-0.00–0.02	0.10	1.75	0.01	-0.02–0.04	0.10	0.80
	Partner	-0.10	-0.20–0.01	-0.10	-1.86	-0.06	-0.30–0.18	-0.06	-0.48
	Education	0.07	0.02–0.11	0.15	2.88*	0.12	-0.04–0.25	0.18	1.51
	Energy	-0.33	-0.42–0.24	-0.36	-7.36†	-0.26	-0.47–0.06	-0.29	-2.57†
<b>Explained variance (%)</b>		15				11			
Model 2:	Gender	0.16	0.02–0.31	0.12	2.20*	-0.10	-0.54–0.34	-0.05	-0.45
	Age	0.00	-0.01–0.01	0.02	0.33	0.00	-0.02–0.03	0.04	0.30
	Partner	-0.07	-0.18–0.05	-0.07	-1.18	-0.07	-0.32–0.18	-0.07	-0.57
	Education	0.06	0.01–0.10	0.13	2.28*	0.06	-0.06–0.23	0.14	1.17
	Memory	0.02	-0.10–0.14	0.02	0.32	0.34	0.03–0.66	0.24	2.16*
<b>Explained variance (%)</b>		3				9			
Total	Gender	0.15	0.02–0.29	0.12	2.20*	0.03	-0.44–0.45	0.00	0.01
Model:	Age	0.01	-0.00–0.02	0.08	1.58	0.01	-0.02–0.04	0.07	0.59
	Partner	-0.08	-0.19–0.03	-0.08	-1.52	-0.05	-0.29–0.19	-0.05	-0.44
	Education	0.65	0.02–0.11	0.15	2.93†	0.10	-0.04–0.24	0.16	1.40
	Memory	-0.04	0.07–0.15	-0.04	0.74	0.24	-0.09–0.57	0.16	1.44
	Energy	-0.35	0.44–0.26	-0.38	-7.61*	-0.21	-0.43–0.00	-0.24	-1.99†
<b>Explained variance (%)</b>		17				14			

B: unstandardized coefficient,  $\beta$ : standardized coefficient, \* Significant at the 0.01 level, † Significant at the 0.05 level



facets showed fewer missing responses in the interview sample, as compared with the self-assessed group, with the exception of two items (Afraid of not being able to control death and Opportunities to love). The greater frequency of missing responses in the self-assessment sample might be related to difficulties in understanding meanings or the non-relevancy of particular items (Mallinson, 1998). It is interesting that 12% of missing responses were related to the item questioning community home care nursing in the interview sample as opposed to 3% in the self-assessed group. These results may be due to memory problems, may represent a sensitive issue for those who chose not to answer, or could be due to the fact some may be unsure of how to answer this item or gauge their response in the categories provided. Respondents in both sub-samples had achieved a basic level of education, one-third had reduced memory, many had medical comorbidities and were older people. This could have led to response order effects in the current study. Literature has described the response effects as being most pronounced among people aged 65 and over (Bowling, 2005). Previous research has suggested that response order effects are stronger for respondents with lower levels of formal education, and these effects are likely to increase with age. Education is negatively correlated with age; therefore, educational differences in response order might in fact reflect differences in age. Consequently, age-related and educational differences in response order might in fact undermine conclusions concerning age differences in QoL (Hanmer et al, 2007). Also, response order can be traced to age-related declines in cognitive resources (Carstensen and Hartel, 2006) and in the self-assessed sample responses could possibly have been missing because of age-related cognitive decline, rather than simply responding out of order—although the self-assessed sample was significantly younger than the interview sample. Overall, the relatively few missing responses in this study might indicate that the questions were relevant to both sub-samples.

Respondents in both sub-samples reported reduced energy (self-assessed 45% and 36% in the interview sample), which might be related to the frequency of missing responses (Bowling, 2005). The results shown here may suggest that self-assessment is even more tiring for respondents and increases respondent burden more than interviewing, despite the fact that the self-assessed sample reported fewer health conditions affecting their QoL. The response rate in the self-assessed sample

(53%) is supported in the literature (Mallinson, 1998). This author reported administration challenges (e.g. misunderstanding, tiredness, items left blank) among older people in answering a postal survey (mean age 77.1,  $n=56$ ), although the respondents had been interviewed using the same questionnaire 3 months earlier.

#### Floor and ceiling effects

It has been documented that respondents have a tendency to present themselves in the best possible light in personal interviews (social desirability) and often give better mean scores than in reality or worse mean scores because they want to be viewed favorably by others. For example, a study found that among the older-old, those scoring higher on wellbeing found it important to persuade the interviewer that they were happy (Hillerås et al, 2001). The results of the study here show ceiling effects for one item in the interview concerning Death and Dying assessing 'scared of dying'. Because death is the ultimate end of a long life, it seems to be a common attitude among people that older people should be calm about issues regarding death and dying and not be scared of dying. The ultimate end of the death process can also be described as a peaceful death. This assumption might be influenced by aspects of the aging process per se. For example, the ninth and last step of Erikson's Life Cycle Theory (Erikson and Erikson, 1997) describes death as a natural end to life rather than a threat, as perceived in earlier years. Therefore, negative aspects about death and dying might not be easy to express in an interview. The significant differences found between the sub-samples for Death and Dying facet might indicate that respondents in the self-assessed sample gave more frank and critical answers. On the other hand, in the interview sample, the respondents were more likely to be non-partnered, living alone, institutionalised, reporting health and memory problems and older than the respondents in the self-assessed sample. Therefore, they may have been thinking more about death and experienced more thoughts regarding death and dying among their friends and family, as supported by authors who have compared QoL among younger and older people (So et al, 2011). In this study, floor effects were also detected, for example, in the Autonomy facet. Andresen and Puggard (2008) claim there are severe challenges in elderly care recipients' perceptions of autonomy. In light of this, one may ask whether the results for floor effects in the interview sample here may reflect

decreased ability to experience autonomy when dependent on nursing care. Although floor and ceiling effects are well-known in the literature (O'Mahony et al, 1998; de Morton et al, 2007). In light of this, one may ask whether the results for floor effects in the interview sample here may reflect decreased ability to experience autonomy when dependent on nursing care.

#### Possibly sensitive items

Sensitive issues have been defined as something that 'potentially poses a substantial threat to those involved' (Lee and Renzetti, 1990). When is an issue threatening? Are some of the QoL items more threatening than others, such as issues regarding death and dying, intimacy and love? Regarding these questions, one could expect more missing item responses in the interview sample, as one can imagine that some respondents may be shocked, feel insulted or feel a high level of discomfort and not want to respond. A higher frequency of missing answers on the 'Opportunities to be loved' and 'Opportunities to love' items could, for example, indicate loneliness in both sub-samples because of a lack of close relationships. It is possible that issues such as loneliness could be perceived as especially sensitive to the respondents in the interview sample as many were not partnered. Notably, despite the authors' feeling that questions regarding intimacy might be considered sensitive items, the results showed no significant differences between the sub-samples. Refusing to answer or answering less positively on questions about intimacy and love might be difficult in an interview setting, as most people want to describe themselves as having somebody to love and experiencing love in their life. On the other hand, the intimacy items might have been more difficult to understand than the other items, as they represent a higher number of missing responses (highest 6.2%). The interviewer reading the item to the respondent might make it less cognitively demanding to answer these questions, by probing discreetly. Therefore, in this study, it might have been easier to answer sensitive and cognitively demanding items among the interview sample. However, love in terms of sex was a response that was often missing and this has been shown to be a sensitive issue among older people in other studies (Chachamovich et al, 2006).

#### Reduced energy reserves

As it is demanding for older respondents to answer comprehensive questionnaires,

the authors invited the respondents to take breaks while answering. The results of this study showed that reduced energy made a significant contribution to overall QoL in both sub-samples when controlling for sociodemographic variables (gender, age, marital status and education). Furthermore, energy explained the lower variance in overall QoL in the interview sample as compared with the self-assessed sample, although the interview sample reported more health conditions that would affect QoL. One might expect that the respondents in the self-assessed sample were more physically healthy, as 98% were living at home as compared with 18% of the interviewed participants who lived in an institution.

Memory problems can also affect data quality. Memory problems occurred more frequently in the interview sample and were significant contributors to the variance in the overall QoL after controlling for sociodemographic variables. Memory problems showed no significant differences between the two sub-samples. As memory problems are well-known to occur in older people (Birren and Schaie, 2006), such problems should be considered when choosing an administration method for a survey; further, surveys should be conducted together with a more comprehensive assessment of cognitive problems (Bowling, 2005).

### Limitations

There are several limitations to this study. There is no record of the type of training interviewers were offered. The authors also do not have a record of the total response or non-responder rates. The non-responders may have represented older people who were more physically and or mentally frail (Picavet, 2001). In the study design, the authors decided a priori on the use of self-assessed questionnaires sent via postal mail and interviewing for the

different sub-samples. An experimental or randomisation method, which allocated the different questionnaire modes to participants, would have strengthened the study (Bowling, 2005). Thus, differences detected in responses between different modes could be due to differences between contextual settings or to genuine differences between respondents, such as cognitive impairment, medication use and side effects, disease severity and comorbidity (del Boca and Noll, 2000). The significant differences according to age and gender between the two sub-samples may have also affected the results. Thus, differences found in QoL were not related to mode of administration within a sample, but associated with inequalities in age and gender (Hanmer et al, 2007). The relatively small sample size in the interview sample may have prevented significant findings in the multiple regression analyses (Polit and Beck, 2012), and thus this data should be interpreted with caution. However, it can be considered a strength of this study that the older people in both sub-samples consisted of randomised heterogeneous groups of older people living in the community with a wide range of health problems, representing many geographical areas in Norway.

Measuring memory loss using a single question might not reflect the complexity of cognitive functioning of the respondents here, which could also limit the generalisability of the findings. Others recommend the use of validated scales, such as the Mini Mental Status (Bowling, 2009) in QoL assessment.

### Study implications

Given the findings here, administration mode may influence data quality and the manner by which older people respond to the data. The self-assessment method might be more cognitively and physically demanding than interviewing. Using the interview method

seems to be connected with fewer missing responses; however, respondents may be more vulnerable to social desirability effects and sensitivity issues. Given the significant sociodemographic differences between the sub-samples, one may question whether older people in general give more frank answers to sensitive questions. Health professionals also need to be aware that reduced energy, reduced memory, gender, age and educational background might influence QoL data regardless of the administration method. Further research on the influence of mixed administration method using randomised samples in their design is warranted. It would also be interesting to compare data in quality in studies among older people with different health status and diseases, and among younger and older adults. Also, comparing data quality across various administration modes including hand computers, web usage and recent technological advances could help raise important questions regarding threats to data quality in research and in clinical settings.

DBN

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### KEY POINTS

- Mode of administration may influence data quality and the manner by which older people respond to quality of life (QoL) measurement tools
- The self-assessment method might be more cognitively and physically demanding than interviewing
- Health professionals need to be aware that reduced energy, reduced memory, gender, age and educational background might influence QoL data regardless of the administration method





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