Dr Smith contributed to the design, data analysis and interpretation, provided a careful review for intellectual content and gave approval of the final manuscript. Dr Munger was principal investigator of the ‘Cache County family-based Cohort Study on Aging’, the companion study that collected initial screening test scores and parental death data, and he provided a careful review of this manuscript for intellectual content and gave approval of the final manuscript. Dr Tschanz contributed to the design, data analysis and interpretation, provided a careful review for intellectual content and gave approval of the final manuscript. Each of the authors, Drs Norton, Østbye, Smith, Munger and Tschanz, has no financial or personal conflicts of interest.

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Rating the quality of life of people with dementia living in residential care facilities in routine research practice

SIR—Measuring the quality of life of people with dementia is overwhelmingly important in ageing research [1, 2]. However, there is remarkably little systematic data available regarding the applicability and inter-rater reliability of the available tools. What little data is available is often gathered by research teams with significant experience in rating the quality of life of people with dementia. Applicability of tools to assess the quality of life of people with dementia in routine research remains uncertain. Although there is evidence that even people with moderate to severe cognitive impairment can reliably rate their quality of life [3], there is little data regarding the effect of different interviewers on the reliability of those assessments.

The Quality of Life in Alzheimer’s Disease (QOL-AD) scale is a brief (generally administered in ~10 min), dementia-specific tool [4]. Versions are available for use both with the person with dementia and an informant. The available data suggest that the QOL-AD has good inter-rater and test–retest reliability [4, 5]. The QOL-AD also appears to be suitable for use to assess the quality of life of people with severe dementia [3].
As a component of the establishment of a large randomised controlled trial of educational interventions to improve the quality of life of people with dementia living in residential care facilities, we aimed to determine the feasibility and inter-rater reliability of assessment of quality of life, using the self-rated QOL-AD administered by two interviewers.

**Methods**

Recruitment and training of research staff were planned. Two phases of the study were planned incorporating:

- Joint administration of the self-rated QOL-AD by two staff until 20 residents had been jointly assessed or, if consistent consensus could not be achieved after jointly administering the QOL-AD to 20 residents, until consistent consensus could be reached.
- An inter-rater reliability study in which both staff members independently administered the self-rated QOL-AD to a further 20 residents, and then crossed over. The second rater administered the QOL-AD within 24 h of the initial administration of the QOL-AD.

Participants were all permanent residents of aged care facilities with a diagnosis of dementia, aged over 65 years and with an MMSE of <24. When severity of dementia precluded the resident from agreeing to or declining participation in the trial, agreement was sought from the resident’s ‘next of kin’. Residents were excluded if the facility staff identified them as being acutely medically unstable or suffering from delirium, or in the terminal stages of a co-morbid illness. The research was approved by the Human Research Ethics Committee of the University of Western Australia, and all participants gave informed consent.

The 15-item self-rated QOL-AD modified for use in long-term residential care settings was administered as a structured interview [2, 6, 7]. Interviewers used a standard set of instructions. Participants were handed their own copy of the questionnaire which they could follow if able to. Participants were able to indicate responses verbally or by circling the response. If the participants were unable to respond to more than two items, they were considered unable to complete the measure and excluded. Results reported relate to the resident (rather than proxy) ratings of quality of life.

Pearson’s $R$ was used to measure correlation and a two-way mixed effects model (single measures) was used to determine intraclass correlation between results gathered by the two interviewers. Cohen’s $kappa$, per cent agreement and linear weighted kappa were calculated for each individual item of the QOL-AD.

**Results**

Two research staff members were recruited. Although both staff had training in the scientific method, neither had any experience in assessment of quality of life of people with dementia, or in clinical research. Both had studied science-related topics at undergraduate level. One had training in the research method to honours level, having completed an animal laboratory-based project. A 2 h training session was held, led by an experienced clinical neuropsychologist (P.B.) with specific clinical and research expertise in the assessment of quality of life of people with dementia [8–10].

Staff found that consensus could be achieved rapidly when administering the QOL-AD jointly. There was disagreement in 5% of cases but a unanimous consensus could be reached in 95% of cases. Staff reported being able to consistently achieve unanimous consensus after administering the QOL-AD to five residents.

Fourteen women and six men participated in the interrater (independent rating) study. The mean age of residents was $87.5 \pm 8.1$ years (range 77–95) and their mean MMSE scores were $15.4 \pm 5.2$ (range 5–22). The mean (SD) QOL-AD score obtained by the first rater was $42.0 \pm 6.4$, and $43.3 \pm 5.8$ by the second rater. The mean difference in total self-rated QOL-AD scores administered by the two interviewers was $3.6 \pm 3.4$ (range 0–11). Intraclass correlation between QOL-AD results from the two interviewers was 0.68. There was complete agreement in only one case. Weighted kappa scores for individual items of the QOL-AD generally indicated poor to moderate reliability (see Table 1).

**Discussion**

Despite the small sample size, these data suggest that the QOL-AD can be implemented in routine research settings.
with relatively little training of research staff. The availability of research personnel (P.B.) with experience in the use of standardised assessments of quality of life of people with dementia was probably helpful, and it is unclear if these results could have been achieved by services where such expertise is not available. In addition, the residential care population in Australia may differ from that in other countries, such as in dependency levels, and these results may not necessarily apply to other populations, although there is no obvious reason to believe they would not.

Inter-rater agreement, as measured by the kappa statistic, can be considered poor (kappa ≤ 0.2), fair (0.21–0.40), moderate (0.41–0.60), good (0.61–0.80) or very good (0.81–1.00) [11, 12]. There was a wide variation in the inter-rater reliability of different items. Interestingly, all items with poor reliability (kappa < 0.2) are items that have been modified for use of the QOL-AD in residential care. These data suggest that more work regarding reliability of the QOL-AD in residential care settings is warranted, or alternatively that these items may be subject to greater short-term instability in the residential care setting.

Despite good overall reliability being indicated by the intraclass correlation coefficient for total QOL-AD scores, kappa scores for individual items were generally only poor to moderate. Thus, although reasonable overall inter-rater reliability may be achieved after relatively brief training of staff, caution is still warranted in the application of the QOL-AD by different raters, given that very high reproducibility (>0.9) is desirable for repeated individual measurements over time [13]. Asking staff to jointly assess residents was seen as a valuable method of training. However, despite the subjective belief of staff that consensus could be achieved consistently, agreement on individual items was at best moderate, indicating the importance of objective assessment of inter-rater reliability, or the inherent instability of self-rated quality of life in this setting.

Key points

- Assessment of quality of life of people with dementia is important.
- The utility of available methods to assess quality of life in routine research settings is uncertain.
- Our data suggest that the QOL-AD is feasible for routine use in aged care research.
- Further data are required regarding inter-rater reliability of the QOL-AD used in residential care settings.

Conflicts of interest

We have no conflicts of interest in relation to these data.

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References

Interruptions to rehabilitation in a geriatric rehabilitation unit: associated factors and consequences*

SIR—Achievement of maximal functional recovery after acute admission to hospital and return of patients to their own home are important goals of inpatient geriatric rehabilitation. Reasonable medical stability, significant functional disability and the ability to learn have been defined as the primary criteria for rehabilitation [1], with successful outcome measured in terms of functional recovery, length of stay, survival and discharge destination [2–9]. Comprehensive geriatric assessment (CGA) [10] at the beginning of the process can identify factors affecting outcome, such as severity and duration of disability prior to rehabilitation, cognitive status and motivation, co-morbidity and social circumstances [11]. Problems associated with interruption of amputee rehabilitation [12] and changes in medical stability requiring transfer back to acute care [13] have also been studied. We conducted a prospective cohort study to determine frequency, associated factors and consequences of interruption to rehabilitation (IR) in patients admitted to a geriatric rehabilitation unit.

Methods

We studied 300 inpatients admitted consecutively to the Unitat de Convalescència of Institut Municipal d’Assistència Sanitària (IMAS) in Barcelona, Catalonia, Spain, over 10 months in 2007. Our geriatric interdisciplinary rehabilitation team provides intermediate care in a 60-bed geriatric rehabilitation inpatient unit. Most patients are admitted directly from acute care (400-bed third level hospital). CGA is performed within 72 h of admission according to pre-determined protocols by the interdisciplinary team. Patients are considered ‘suitable’ to be introduced into the programme if medically stable and judged able to participate in therapy, as indicated by CGA. Medical therapies, nursing care and social evaluations are integrated to inform the development of an individualised interdisciplinary intervention programme for all appropriate patients. Achievements of rehabilitation goals, independence in activities of daily living (ADL), management of general medical conditions and discharge plans are reviewed formally each week. The standard rehabilitation programme consists of daily sessions of treatment (physiotherapy, occupational therapy and speech and language therapy, depending on need) of 1-h duration on 5 days a week.

During the study period, an admission protocol recorded demographic characteristics and evaluation of ADL, cognition, mood, co-morbidity and the presence or absence of the main geriatric syndromes. Patients or carers were asked about ability to carry out ADLs before their initial hospitalisation, as well as at the time of admission, using the Lawton Index [14] and Granger version of the Barthel Index [15]. Cognitive function at admission was measured with the Spanish version of the Mini-Mental State Examination (MMSE) [16] and mood with the Spanish version of the 15-item Geriatric Depression Scale (GDS) [17]. Co-morbidity was assessed using the Charlson Index [18]. A checklist was used to record other general factors that might impact on rehabilitation, including the presence of geriatric syndromes, sensory disorder affecting ADLs, undernutrition, constipation, incontinence, pressure ulcers, confusion (dementia and/or delirium) and polypharmacy (>5 drugs).

IR was defined as interruption of three or more consecutive days to the planned rehabilitation programme, because of medical, cognitive or mood disturbance. After interruption, the interdisciplinary team evaluated causes of IR. Final outcome of admission in terms of improvement in ADL function or efficiency (Barthel Index gain per day) and discharge destination were analysed. For purposes of statistical analysis, subjects were divided into two groups depending on the presence or absence of IR. Univariate analyses used appropriate parametric and non-parametric statistical tests to look for associations with IR and statistically significant variables were then introduced into a multivariate logistic regression model.

Results

We analysed 300 patients [mean (SD) age 77.6 (11.1) years; 63% females] admitted for CGA and subsequent rehabilitation when appropriate. The primary medical conditions leading to the need for admission to the geriatric unit were orthogeriatric in 129 (43%), deconditioning following acute illness in 95 (32%), stroke in 61 (20%) and amputation in 15 (5%). After assessment, 247 patients (82%) started an individualised rehabilitation programme. The main causes of not being involved in the standard programme were medical instability, or a judgement by the interdisciplinary team that rehabilitation was not needed or not feasible.

Rehabilitation was interrupted (IR group) in 54 of the 247 patients entering the programme. The main causes of interruption were acute infection in 19 (35%), acute worsening of chronic disease in 12 (22%), acute confusion in 10 (19%) and other causes in 13 (24%). The rehabilitation programme did not resume after IR in 35 (65%) of the 54 patients, with 9 deaths and 23 requiring transfer back to the acute hospital unit, of whom 5 died, 4 were discharged...