Occupational therapy compared with social work assessment for older people. An economic evaluation alongside the CAMELOT randomised controlled trial

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Abstract

Objectives: to compare costs and outcome of occupational therapy-led assessment with social worker-led assessment of older people, in terms of their independence and quality of life.

Design: cost-effectiveness analysis alongside a randomised controlled trial. The analysis took viewpoints of health services and patients. The primary outcome measure for cost-effectiveness was dependency using the Community Dependency Index (CDI). Secondary outcomes included utility scores based on the EuroQoL (EQ-5D). Resource use was measured for each patient, from clinical records and from patient carer interviews at 8 months. Unit costs of health and social care resources were derived from local sources and national datasets. Cost-effectiveness was analysed using cost-effectiveness acceptability curves.

Results: there were no differences between the two arms of the trial in terms of cost-effectiveness. There is an apparent increase in mean cost per case for the occupational therapy arm but this is not statistically significant (mean difference in cost per case £542, 95% CI £434–1,519). Mean total costs of care per participant were £4,379 and £3,837 for the occupational therapy and social work arms, respectively. At best the intervention would improve outcomes at a cost of £14,000 per quality-adjusted life year (QALY). The probability of such an outcome was <50%.

Conclusions: from a policy perspective, the lack of difference in clinical and cost-effectiveness means that either a social work or an occupational therapy service is successful in making care assessments that enable an older person to remain in their own home.

Keywords: community, economic evaluation, older people, occupational therapy, randomised controlled trial, elderly

Introduction

Existing literature on the costs of care for frail older people living in the community has focused on a number of narrow themes, including cost-effectiveness analysis of primary and secondary prevention in the elderly [1–6]. None of these studies addressed the question of cost-effectiveness of different professional groups in the management of frail older people in the community.

A previous study [7] of service use and costs for older people in formal care found costs per person per week of £64.50. A separate pilot study [8] developed cost measures for a home nursing intervention supporting frail older patients. This found lower overall costs associated with the intervention group, but the difference was not significant.
Design of the economic evaluation

The design and clinical results of the CAMELOT trial have been reported in a separate paper [9]. The trial was also designed to explore the relative cost-effectiveness of the services provided. The study was designed to compare costs and consequences, and to perform cost utility analysis, based respectively on the Community Dependency Index (CDI) and the EuroQol (EQ-5D) health status valuation at follow-up. The economic study also aimed to describe costs in a group of frail older patients for whom costs have not been systematically measured and described.

The analysis was designed to take the viewpoints of the health and social care sector as a whole, with separate analyses for health and social services sectors, participants and carers.

Methods for data collection

Trial data collection was designed to collect health gain data from participants and carers at baseline and follow-up using the CDI and EQ-5D. At follow-up, participants and carers were also asked about their own costs in the previous 8 month period.

Costs of the services used by each participant were estimated from the quantities of each type of resource used multiplied by the unit cost. Data about health and social services resource use were collected directly from clinical records at each of the agencies providing care. A data collection pro forma recording numbers of client contacts of different types and services provided was used for each of the following: general practice, social services, community health services, equipment supplies agency and local authority housing department. Researchers visited the providers to extract service use information from case notes for each participant. Participant consent included agreement for the research team to access both health and social care records. General practitioner and community and social services consent was also sought and granted for access to clinical records. Ethical approval for the CAMELOT trial included with caring was not measured.

All costs are given at 2001 prices in pounds sterling (US $1.59 = Euro 1.47 at the time of writing).

The costs per participant for each sector were aggregated and compared between trial arms, using Excel software. Complete case analysis was performed. Confidence intervals were estimated using bootstrap estimation.

Statistical sensitivity analysis was conducted by estimation of confidence intervals for mean difference in cost per participant, and by plotting cost-effectiveness acceptability curves. Cost-effectiveness acceptability curves allow decision makers to assess the overall probability of cost-effectiveness given particular thresholds [11]. This was repeated using each of three different measures of effectiveness: predicted quality-adjusted life years (QALYs) based on life expectancy, QALY gain from baseline to 8 months, and changes in the independence measured by the CDI. Discounting of life expectancy when calculating QALYs was also performed as part of a sensitivity analysis.

Results

There was not a clear difference in effectiveness between the allocated groups in the CAMELOT trial [9]. The study compared the effectiveness of occupational therapist (OT)-led with social worker (SW)-led assessments of 321 older people in terms of their own dependency and quality of life at the 8 month follow-up. However, for those carers who were included in the follow-up, the OT arm had significantly better quality of life scores.

The mean QALY gains at 8 months, and projected for life are shown in Table 1. The table also shows the difference between groups in change in CDI.

The cost data are presented in Table 2. It shows the costs per participant divided into public sector costs and those borne by participants and their carers. Public sector costs are further subdivided by providing authority.

<p>| Table 1. Measures of utility based on differences between baseline and 8 month follow-up data |
|----------------------------------|----------------------------------|----------------------------------|</p>
<table>
<thead>
<tr>
<th></th>
<th>EQ-5D and life expectancy data</th>
<th>EQ-5D not including life expectancy data</th>
<th>Community Dependency Index not including life expectancy data</th>
</tr>
</thead>
<tbody>
<tr>
<td>SW</td>
<td>−0.38</td>
<td>−0.06</td>
<td>3.70</td>
</tr>
<tr>
<td>OT</td>
<td>−0.33</td>
<td>−0.05</td>
<td>2.29</td>
</tr>
<tr>
<td>Mean difference</td>
<td>0.05</td>
<td>0.01</td>
<td>−1.41</td>
</tr>
</tbody>
</table>
Mean total costs of care per participant over the 8 month period were £4,379 and £3,837 for the OT and SW arms, respectively. The difference in mean cost per case was £542 (95% CI £434–1,519). The wide confidence interval reflects high variability in cost between trial participants.

Costs to the public sector, both NHS and Local Authority, represented the majority of the overall social cost (87% of mean cost per participants for the OT arm; 83% for the SW arm).

The value of equipment and adaptations and home care services was significantly higher in the OT arm by £581 (95% CI £178 and £984).

Mean primary and community care costs, including all contacts with health professionals in general practice or community NHS care, were equivalent for both arms.

Mean secondary health service costs were higher per participant overall in the OT arm by £103 (95% CI £508 and £714).

Participants’ and carers’ costs represented about 14% (OT arm) and 17% (SW arm) of total costs, and showed a mean difference between arms of £59 more in the SW arm. Differences in costs were significantly different between the two arms for carers (P=0.02, t-test) but not for the participants.

All trial participants had complex and frequent prescribed medicines. There was no statistically significant difference in the cost between groups.

Appendices 2a–c (supplementary data on the journal’s website) show the distribution for each measure of cost-effectiveness based on non-parametric bootstrap estimation. Cost-effectiveness acceptability curves are shown in Appendices 3a, 3b and Figure 1. Each graph shows the probability that the incremental cost of health gain exceeds a chosen threshold of ‘affordability’ shown on the x-axis. The analysis based on QALYs generated by combining life expectancy data and quality of life data was the only case where the probability of a marginal cost-effectiveness difference reached 50%. At best this means having to spend sums of up to £14,000 for a QALY gain, but in 50% of simulated analyses the OT intervention was not relatively cost-effective at any threshold. Discounting life expectancy did not alter the results.

**Discussion**

We found that mean total costs of care were higher for the OT arm, but the difference was not statistically significant at the 95% level.

Hospital costs were higher for the OT arm but this was not statistically significant. These costs were based on length of stay in hospital at an assumed NHS per diem rate of inpatient care for elderly people, which is similar to the cost of an average inpatient day for all patients. This may be
an underestimate if admissions were for intensive emergency treatment, but we had no evidence of this. This would not alter the statistical cost results but would increase the estimated average cost per case for all patients in the trial.

There were some differences in categories of costs between the two arms of the trial, most noticeably in total equipment and adaptations use between arms. Although primary and community health care costs were not significantly different overall, increased referral to other health care agencies led to higher primary care staffing costs in the OT arm. The low proportion of total health care cost accounted for by the drug costs in both arms of the trial reflects the fact that most of the drugs prescribed are generic low-cost preparations.

Home care packages in CAMELOT accounted for approximately 24% of the cost of the overall 'care package' including the cost of equipment and adaptations. This compares to another recent study [12] in which home care costs calculated in the same way accounted for between 36% and 56% of the total package. This variation may have arisen due to differences in how a care package is defined.

Participants’ and carers’ costs represented about 15% of total costs in the trial. The costs for participants and carers are an approximate and limited estimate of out-of-pocket costs. The questionnaire relied on recall and, like other questionnaires for measuring costs, was not formally validated. No estimate has been made of additional costs of the time of volunteer carers, which may have been an important omission.

Overall, outcomes were not different for patients, so a cost minimisation analysis (CMA) approach is acceptable, but in this case even CMA is inconclusive. As the trial was not powered to demonstrate cost differences, we used cost-effectiveness acceptability curves to explore uncertainty around the cost-effectiveness estimates, but we found <50% probability that early OT intervention would be more cost-effective than the alternative in the local circumstances.

**Comparisons with other findings**

The mean costs per participant in CAMELOT are higher than those estimated in a UK MRC study on ageing [7], which cited costs that over 8 months equate to £2,062. Differences in populations and severity of illness between these two studies may account for this. Although both studies had similarly aged participants, CAMELOT also included aspects of service not explicitly costed in the MRC study, such as telephone calls, letter writing, drugs and equipment.

An American trial by Hay et al. [6] compared occupational therapy for older people to a social activity group and a non-treatment group. This study evaluated the cost-effectiveness of the occupational therapy programme, which focused on preventative measures. The researchers also measured quality of life, although unlike CAMELOT, they used the Short Form Health Survey (SF-36) rather than the EuroQoL for calculating QALYs. Findings suggested health, social functioning, quality of life benefits and cost-effectiveness improvements as being statistically significant.

**Recommendations for decision makers and implications for future research**

The costs of services in this research project were estimated during a period of integration between health and social services and therefore may not be representative of future practice. Future service plans should take account of possible changes to service provision and cost following complete integration.

From a policy perspective, the lack of difference in clinical and cost-effectiveness means that both social services and occupational therapy are successful in making care assessments that enable older people to remain in their own home. Contrary to commonly held views, it has been shown that the care costs of formal inpatient care for frail and dependent older people can be lower than supportive care provided in a person’s home [7].
Some of the issues discussed in the report of the trial [9] will be of particular importance for economic decision makers and may need further investigation. Firstly, carers’ outcomes were different between the trial arms. It was not the aim of this trial to assess effects on all carers specifically, but only if and when they wished to be involved and/or when the elderly person was not able to respond themselves. Other studies [13, 14] suggest that the carers’ involvement is key to the welfare of older people at home. The economy of the wider caring network needs more sophisticated measurement than was possible in this study. The number and follow-up of carers participating in the CAMELOT trial provided less than full data and make analyses from the carer perspective difficult.

Other methodological issues for the economic analysis include whether the EQ-5D is a valid measure of quality of life for older people. It has been suggested [12] that more work be done to validate measures of quality of life in the elderly for economic studies. Despite these concerns, there is evidence of EQ-5D being used in a range of studies to elicit utility values from older populations [15–17].

Existing guidelines for health economic evaluation have concentrated on evaluation of drug treatments and new technologies in secondary care settings [18]. Practical guidance on economics studies in primary and social care settings is more limited [19, 20]. The variety of agencies and modes of care involved makes such studies more difficult. There are still few tested research tools for cost measurement, and this is especially true in the settings considered in this trial. Nevertheless, the numbers of people with disabilities in old age present a challenge to services. With such tools, uncertainties about trends in health expectancy and the potential for large growth in the costs of care can be addressed more rigorously [21].

A final point arising from the CAMELOT trial concerns the installation of home adaptations. Full costs of these were included in our analysis. However, as most had not been achieved before the trial follow-up and so could have had little effect on outcomes, this analysis may have produced a pessimistic view of cost-effectiveness. Further research on cost-effectiveness of OT assessment should consider how to achieve the earlier installation of equipment, and/or include longer follow-up than was possible in this study.

Key points

- From an economics perspective, a change in utility over time is a key measure. There was no obvious change over time in EQ-5D in either group for participants.
- The patterns and amount of care resources provided to the older people participating in this community-based trial were different between the two groups, but also very variable within each arm of the trial.
- Total costs of care for the two arms of the trial were not different.
- The occupational therapy assessment was not more cost-effective in achieving additional QALYs for older people than the social work assessment in this community context.

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Contributors

All authors were involved in the study and final approval of the article. M.M. and C.F. were involved in the acquisition, analysis and interpretation of the data and drafted and revised the article. W.L.S. and S.S. were involved in the acquisition of the data, data entry and draft revisions. I.H. and F.P. interpreted the data and revised the article. M.M. will act as guarantor. There were no conflicts of interest.

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References

An in-service evaluation of hip protector use in residential homes

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Abstract

Background: the establishment of a hip protector service has allowed us to study eligibility, acceptability and compliance with use, reasons for non-use, and the effect of dementia, confusion, incontinence and risk of falling.

Methods: all residents in all residential homes in Poole were assessed at baseline. All eligible residents were offered 1 week’s trial of protectors and those who wished to continue were given a set of protectors. Compliance was assessed at 3, 6 and 12 months. Percentages shown for compliance exclude those who died, were transferred, had lost data or in whom follow-up was not yet completed.

Results: over 18 months, 873 residents from 47 homes were identified (mean age 88 years, female:male 4.5:1). Of these, 745 were considered eligible to wear protectors (86%) and 535 agreed to wear them after 1 week (72%). Compliance over 12 months was 78%. Most wearers wore protectors every day. At 3 months, 83% of demented compared to 73% of not demented residents (P = 0.023), 86% of always confused, 77% of sometimes confused and 72% of never confused (P < 0.009) and 82% of incontinent compared to 73% of continent residents (P = 0.024) were wearing hip protectors. There was a positive linear trend between the risk of falling and compliance (P = 0.048).