
Cost-effectiveness of preventive occupational therapy for independent-living older adults

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Record Status

This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

Health technology

The health intervention examined in the study was preventive occupational therapy (OT) to obtain successful ageing, such as improvements in health, function, and quality of life. The intervention consisted of weekly sessions involving 8 to 10 participants, who were helped to a better appreciation of the importance of meaningful activity in their lives through didactic teaching and direct experience with a broad range of activities. The central theme of the OT programme was health through occupation, defined as regularly performed activities such as grooming, exercising, and shopping. Participants were followed by registered occupational therapists trained in working with the elderly.

Type of intervention

Other: occupational therapy.

Economic study type

Cost-utility analysis.

Study population

The study population comprised independent-living elderly people, aged 60 years or older. Subjects were excluded if they were unable to live independently or if they exhibited marked dementia.

Setting

The setting was community. The economic study was conducted in two federally subsidised apartment complexes for older adults California, USA.

Dates to which data relate

No dates were reported. The price year was 1995.

Source of effectiveness data

The source of the effectiveness evidence was a single study, the results of which were published in a separate paper.

Link between effectiveness and cost data

The costing was performed prospectively on the same patient sample as that used in the effectiveness study.

Study sample

Power calculations were performed in the original study: assuming a 20% attrition of subjects over 9 months and conducting testing of hypotheses at the 0.05 level (1-tailed), a projected sample size of 360 (with a 2:1 allocation ratio) gave 80% power in detecting a moderate population effect size (greater than or equal to 0.3) attributable to the OT treatment. Methods of enrolment included staffed recruitment tables placed in facility lobbies and at on-site functions

such as dances and coffee hours, flyers, articles in the residence newsletter, presentations at regular meetings such as the Senior Citizens Club, and letters placed under residents' doors. Eligible subjects in the study area were invited to participate. Of an initial sample of 376 individuals, 12 withdrew prior to inclusion in the study for personal reasons and 361 eligible subjects (143 enrolled in cohort 1 and 218 in cohort 2) were enrolled in the study: 122 subjects were assigned to the OT group, 120 subjects to the active control group, and 119 subjects to the passive control group. However, only data from cohort 2 were used in the analysis (218 individuals). At the end of the follow-up period 55 individuals were lost to follow-up and there were 51 subjects in the OT group, 53 subjects in the active control group, and 59 subjects in the passive control group. Due to the lack of statistically significant differences between the active control group and the passive control group at time of outcome assessment, the two control groups were combined. The only difference between those who left the study and those who remained was ethnicity: significantly fewer Hispanic and English-speaking Asians completed the survey than did not.

Study design

This was a randomised controlled trial, conducted in two federally subsidised apartment complexes for older adults in the area of Los Angeles in California. Randomisation was based on computer-generated random numbers and a blocking factor of 6. Subjects in the study were assessed after the treatment period of nine months (post-test assessment) and after a six-month follow-up (follow-up assessment). Follow-up data were available for 47 of the 51 subjects in the OT group, 47 of the 53 subjects in the active control group, and 54 of the 59 subjects in the passive control group. Study therapists were blind to the study hypothesis.

Analysis of effectiveness

The analysis of the clinical study was based on intention to treat. In the original study several outcome measures were assessed, whilst in the present study the primary health outcome was the patient quality of life index associated with each treatment, assessed using the RAND SF-36 instrument, which provided quality of life information based on responder's recall of functioning during previous months. Study groups were shown to be comparable at baseline in terms of demographics and clinical characteristics.

Effectiveness results

The results of the SF-36 quality of life assessment were not reported. The authors reported that, after the treatment, the analysis showed a statistically significant improvement in terms of quality of life, favouring the OT group. "Approximately 90% of the therapeutic gain observed after OT treatment was retained in follow-up, in the absence of further intervention".

Clinical conclusions

It appears that the OT treatment was effective in improving quality of life in independent-living elderly people.

Measure of benefits used in the economic analysis

The benefit measure used in the economic analysis was quality-adjusted life-years (QALYs), which were calculated using an established formula and assuming that quality of life measures remained stable for 6-months. Utility weights were derived from quality of life scores calculated using the SF-36 method and converted to Health Utility Index (HUI). HUIs were adjusted for planned covariates, such as gender, age group, disability status, Mini-Mental Status examination, and living status.

Direct costs

A 3% discount rate was used to calculate annualised costs (even though the time horizon of the study was shorter than two years). Unit costs and quantities of resources were reported separately only for some items. The economic analysis included the programme costs, healthcare costs (physician office visits, health-professional home visits, hospital outpatient services, and hospital overnight stays), and caregiver costs (paid and unpaid in-home support). The cost/resource boundary adopted appears to have been that of the third party payer. The estimation of costs was based

on actual reimbursement rates, derived from Medicare payments. Quantities of resources were estimated in the effectiveness study. The price year was 1995.

Statistical analysis of costs

Log-transformed costs were compared between treatment groups at baseline, after treatment and at follow-up using analysis of variance methods.

Indirect Costs

Indirect costs were not included in the analysis.

Currency

US dollars (\$).

Sensitivity analysis

Sensitivity analyses were not conducted.

Estimated benefits used in the economic analysis

In the comparison between the OT group and the combined control group, HUI scores were 83.2+/-1.7 and 80.1+/-1.1, respectively, with a difference of 3.1, (p=0.13, non-significant).

The HUI-adjusted at baseline was 81.0+/-1.7 for the OT group and 81.0+/-1.1 for the combined control group.

The HUI-adjusted in the treatment phase was 80.8+/-1.3 for the OT group and 76.5+/-0.8 for the combined control group.

The change in the HUI-adjusted after the treatment phase was -0.2+/-1.3 for the OT group and -4.5+/-0.8 for the combined control group, with a difference of 4.3, (p<0.01).

The HUI-adjusted in the follow-up phase was 80.8+/-1.3 for the OT group and 76.1+/-0.9 for the combined control group.

The change in the HUI-adjusted after the follow-up phase was -0.2+/-1.3 for the OT group and -4.9+/-0.9 for the combined control group, with a difference of 4.7, (p<0.01).

The average HUI-adjusted was 80.8+/-1.1 for the OT group and 76.3+/-0.7 for the combined control group.

The change in the average HUI-adjusted was -0.2+/-1.1 for the OT group and -4.7+/-0.7 for the combined control group, with a difference of 4.5, (p<0.01).

The last difference represented the incremental QALY gain with OT over combined control. Similar results were obtained comparing the OT intervention with the active and the passive control groups. In particular, the incremental QALY gain with OT was 4.0 over the passive control group and 5.2 over the active control group. All differences in QALYs reached statistical significance.

Cost results

Programme costs were \$548 in the OT group, \$144 in the active control group, and 0 in the passive control group (\$68 in the combined control group).

Healthcare costs were \$2,516+/--\$6,434 in the OT group, \$2,184+/--\$6,155 in the active control group, and \$2,160+/--\$3,320 in the passive control group (\$2,171+/--\$6,214 in the combined control group) for treatment and

\$967+/- \$1,808 in the OT group, \$1,726+/- \$3,253 in the active control group, and \$3,334+/- \$7,435 in the passive control group (\$2,593+/- \$5,918 in the combined control group) for follow-up.

Caregiver costs were \$2,226+/- \$7,774 in the OT group, \$1,798+/- \$4,517 in the active control group, and \$3,228+/- \$8,521 in the passive control group (\$2,551+/- \$6,929 in the combined control group) for treatment and \$3,177+/- \$10,425 in the OT group, \$2,251+/- \$5,322 in the active control group, and \$2,944+/- \$8,388 in the passive control group (\$2,625+/- \$7,116 in the combined control group) for follow-up.

Annualised total costs (including healthcare costs and caregiver costs) were \$4,741+/- \$11,654 in the OT group, \$3,982+/- \$9,079 in the active control group, and \$5,388+/- \$13,055 in the passive control group (\$4,723+/- \$11,321 in the combined control group) for treatment and \$4,145+/- \$10,801 in the OT group, \$3,978+/- \$5,949 in the active control group, and \$6,278+/- \$11,803 in the passive control group (\$5,218+/- \$8,588 in the combined control group) for follow-up.

No statistically significant difference was found in the costs among the study groups. As a result, the authors assumed that medical costs were the same for each treatment group.

Synthesis of costs and benefits

An incremental cost-utility analysis (OT versus each of the control groups) was used to combine costs and benefits of the interventions. As total costs were not statistically significantly different across the study groups, only programme costs were considered. The incremental cost per QALY gained with OT was \$10,666 (95% CI: \$6,747 - \$25,430) over the combined controls, \$13,784 (95% CI: \$7,724 - \$57,879) over the passive control, and \$7,820 (95% CI: \$4,993 - \$18,025) over the active control. The model was validated by converting the SF-36 scores into Quality of Well-Being preferences scores.

Authors' conclusions

The authors concluded that the intervention based on OT proved to be cost-effective in comparison with generalised social activity programmes or no therapy. OT led to gains in quality of life scores and showed a trend toward decreased medical expenditures.

CRD COMMENTARY - Selection of comparators

The rationale for the choice of the comparators was clear. Both comparators (no intervention and active control therapy) were selected as they represented possible options for the population of elderly people examined in the study. You, as a user of this database, should decide whether they are widely used interventions in your own setting.

Validity of estimate of measure of effectiveness

The analysis of effectiveness was based on a randomised controlled trial, which was appropriate for the study question. The method of randomisation was reported and power calculations were conducted. The effectiveness analysis was based on intention to treat and study groups were generally comparable at baseline. Statistical analyses were conducted to test for bias or possible confounding factors. These issues tend to increase the internal validity of the effectiveness analysis. However, the study sample comprised volunteers, thus it was not clear whether it was representative of the study population. Finally, the authors noted that a possible limitation of the study was the restricted follow-up period.

Validity of estimate of measure of benefit

QALYs were used as benefit measure in the economic analysis. The method used to derive QALYs was validated using a different approach. The use of QALYs ensures the comparability of the benefits of the intervention considered in the study with those from other interventions funded in the health care system.

Validity of estimate of costs

Although the authors stated that the study was conducted from a societal perspective, it seems that only costs relevant to the reimbursement authority were included in the analysis. It is possible, as acknowledged in the paper, that the approach used in the study underestimated commercial charges for medical services and professional caregivers. Standard statistical analyses were conducted to assess for statistical significance of total costs. The price year was reported. However, unit costs were reported separately from quantities of resources only for certain cost items. Costs were specific to the study setting and no sensitivity analyses were conducted. As total costs were not statistically significantly different across the study groups, the authors assumed that medical costs were the same for each treatment group. The authors acknowledged that the lack of statistical significance was caused by the large variability of healthcare costs and the limited sample size in the OT group.

Other issues

The authors did not compare their findings with those from other studies. The issue of the generalisability of the study results to other settings was not addressed and sensitivity analyses were not performed, thus limiting the external validity of the analysis. The study enrolled independent-living elderly people and this was reflected in the conclusions of the analysis. The authors reported some limitations of their analysis, mainly related to the limited follow-up period and the variability in the estimated costs.

Implications of the study

The authors suggest that further research should focus on the impact of specific factors, such as treatment setting, size of treatment groups, age and degree of the study sample, and on the estimated cost-effectiveness of the intervention. The length of the study appears to be the crucial variable in the assessment of long-term effects of the OT intervention.

Source of funding

Supported by grant R01 AG11810 from the National Institute on Aging; the National Center for Medical Rehabilitation Research; the Agency for Health Care Policy and Research; the American Occupational Therapy Foundation Center at USC for the Study of Occupation and its Relation to Adaptation; the RGK Foundation and Lumex Inc; and Smith & Nephew Roylan.

Bibliographic details

Hay J, LaBree L, Luo R, Clark F, Carlson M, Mandel D, Zemke R, Jackson J, Azen S P. Cost-effectiveness of preventive occupational therapy for independent-living older adults. *Journal of the American Geriatrics Society* 2002; 50(8): 1381-1388

PubMedID

[12164994](#)

Other publications of related interest

Clark F, Azen SP, Zemke R, Jackson J, Carlson M, Mandel D, Hay J, Josephson K, Cherry B, Hessel C, Palmer J, Lipson L. Occupational therapy for independent-living older adults: a randomized controlled trial. *JAMA* 1997;278(16):1321-1326.

Clark F, Azen SP, Carlson M, Mandel D, LaBree L, Hay J, Zemke R, Jackson J, Lipson L. Embedding health-promoting changes into the daily lives of independent-living older adults: long-term follow-up of occupation therapy intervention. *The Journals of Gerontology. Series B, Psychological Sciences and Social Sciences*. 2001;56(1):P60-P63.

Indexing Status

Subject indexing assigned by NLM

MeSH

Activities of Daily Living; Aged; Aged, 80 and over; Cohort Studies; Cost-Benefit Analysis; Female; Health Care Costs; Health Services for the Aged /economics; Humans; Male; Middle Aged; Occupational Therapy /economics; Preventive Health Services /economics; Program Evaluation; Quality of Life; Quality-Adjusted Life Years

AccessionNumber

22002001406

Date bibliographic record published

30/04/2003

Date abstract record published

30/04/2003