Cost-utility analysis of a pharmacy-led self-management programme for patients with COPD

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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.

CRD summary
This study examined the cost-effectiveness of a pharmacy-led programme of education and self-management for patients with chronic obstructive pulmonary disease. The authors concluded that the structured programme improved health outcomes and reduced health care costs, compared with usual care. The methods were valid and the authors’ conclusions appear to be robust.

Type of economic evaluation
Cost-utility analysis

Study objective
This study examined the cost-effectiveness of a pharmacy-led programme of education and self-management for patients with chronic obstructive pulmonary disease (COPD).

Interventions
The programme consisted of a one-hour consultation with a hospital pharmacist in which patients were educated individually on COPD, their prescribed medication, the importance of adherence, inhaler technique, and the management of COPD symptoms and exacerbations. This was followed by two 20-minute telephone calls, three and nine months later, and two 30-minute out-patient visits, six and 12 months later. This programme was compared with usual care, which included symptom assessment, spirometry, and the prescription of inhalers and medication, as necessary.

Location/setting
UK/out-patient.

Methods
Analytical approach:
The economic evaluation was carried out alongside a clinical trial, with a one-year time horizon. The authors stated that they took the perspective of the UK NHS and Personal Social Services.

Effectiveness data:
The clinical data were from a randomised controlled trial (RCT), carried out at the Mater Hospital in Belfast (Northern Ireland). This enrolled 173 patients; complete data were available for 127 of these, with 64 (mean age 66.2 years; 57.8% women) in the programme group and 63 (mean age 66.6 years; 55% women) in the usual care group. The reasons for drop-out and loss to follow-up were provided. Randomisation was carried out using the minimisation method, and follow-up was one year. The primary endpoint was the change, from baseline to one year, in health-related quality of life.

Monetary benefit and utility valuations:
Health-related quality of life was estimated by the patients who were enrolled in the clinical trial, using the European Quality of life (EQ-5D) instrument, at baseline, six months, and one year. Preference weights were derived, using the time trade-off technique, from a representative sample of the general population.

Measure of benefit:
Quality-adjusted life-years (QALYs) were used as the summary benefit measure.

Cost data:
The economic analysis included the costs of hospital pharmacist’s time, general practitioner (GP) visits, emergency department visits, hospital bed days, and the programme, including steroids and antibiotics for exacerbations, the administrator’s time, printing, and overheads. Resource quantities were collected by a specific questionnaire, from patients in the clinical trial, and from their medical records. The unit costs were from national sources, such as the Personal Social Services Research Unit, the British National Formulary, NHS trusts, and the Belfast Health and Social Care Trust. All costs were in UK pounds sterling (£), at 2006 to 2007 prices.

Analysis of uncertainty:
Bootstrapping was used to calculate 95% confidence intervals around the projected model outcomes. A similar approach was used to assess the overall uncertainty and to produce cost-effectiveness acceptability curves. An imbalance in the mean baseline utility between groups was controlled for using multiple regression. One-way sensitivity analyses were carried out by varying the number of bed days and the cost of the programme. Missing QALY and cost data were imputed using linear regression, with treatment group, age, gender, and COPD severity as covariates.

Results
Over one year, the programme improved the QALYs by 0.065 over usual care, but this improvement was not statistically significant (95% CI 0.000 to 0.128). There were fewer GP visits, hospital bed days, and oral steroids and antibiotics with the programme and these differences were statistically significant. The intervention saved £671.59, but this saving was not statistically significant (95% CI -1,584.73 to -68.14).

In the base case, the programme was dominant as it was more effective and less expensive. The programme was cost-effective, at a threshold of £20,000 per QALY gained, in 95% of simulations.

The programme was dominant in all scenarios tested, except when the number of bed days was assumed to be similar between groups. In this scenario, the incremental cost per QALY gained was £3,278.

Authors’ conclusions
The authors concluded that the structured education and self-management programme, led by pharmacists, improved health outcomes and reduced health care costs, compared with usual care. Further research was needed into which aspects of the programme had the greatest impact on the cost-effectiveness results.

CRD commentary
Interventions:
The rationale for the selection of the comparators was clear. The proposed intervention was compared against the standard care in the authors’ setting. More detail on the usual care could have enabled the transfer of the study to other settings, where usual care might be different.

Effectiveness/benefits:
The clinical evidence came from a randomised trial and its methods should ensure the validity of the clinical inputs. The inclusion and exclusion criteria were clearly presented. The two groups were comparable at baseline in their clinical and demographic factors. A per protocol analysis was conducted, meaning that only patients with complete data were analysed. The authors did not report if the patients who dropped out of the study were similar to those who completed it, but multiple imputation of missing data was performed and its impact on the cost-effectiveness results was minimal. The sample size was not justified and the evidence was from one institution, which might not represent other health care centres. QALYs were an appropriate benefit measure, given the impact of COPD on quality of life. The approach used to derive health-related quality of life was clearly described.

Costs:
The cost items and their sources were consistent with the perspective adopted and UK official tariffs set by the public payer were used. The unit costs, key resource quantities, and the price year were presented, enhancing the ability to replicate or update the analysis. Statistical analyses of the costs were carried out to assess the differences between
groups and to consider the impact of baseline factors on the total costs.

Analysis and results:
The results were extensively presented and a valid approach was used to assess the cost-effectiveness of the intervention. The uncertainty was satisfactorily investigated and the results of the various sensitivity analyses were clearly presented. The authors stated that the utility values found in this study were lower than those of other published analyses, but this was typical of the Belfast area. This means it might be difficult to transfer these results to other settings.

Concluding remarks:
The methods were valid and the authors’ conclusions appear to be robust.

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