Cost-effectiveness of enhancing primary care depression management on an ongoing basis
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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 study compared two primary care depression management techniques, usual care versus enhanced primary care. Usual care consisted of the depression management provided over 24 months as part of regular care. Enhanced care consisted of the depression management trained primary care teams provided over 24 months using chronic care management principles. Practices assigned to enhanced care encouraged depressed patients to engage in active treatment, and used practice nurses to provide regularly scheduled care management during the course of 24 months.

Type of intervention
Treatment.

Economic study type
Cost-utility analysis.

Study population
The study population comprised depressed patients visiting primary care clinics who were starting on a new treatment episode. The patients had to have reported at least five of the nine Diagnostic and Statistical Manual of Mental Disorders (DSM-III-R) criteria for major depression in the past 2 weeks. Patients who were illiterate in English were excluded from the study, as were eligible patients who met criteria for bereavement, mania, alcohol dependence, pregnancy or postpartum, or life-threatening physical diseases. Also excluded were those who were cognitively impaired, and those who had no intention to use the clinic as their usual source of care in the following year.

Setting
The setting was the community and primary care. The economic study was carried out in the USA.

Dates to which data relate
The patients were enrolled from April 1996 to September 1997 and were followed up for 2 years from October 1996 to September 1999. All costs were reported for the fiscal year 2000.

Source of effectiveness data
The effectiveness data were derived from a single study.

Link between effectiveness and cost data
Although not explicitly stated, it seems that costing has been carried out retrospectively on the same sample of patients as that used in the effectiveness analysis.

Study sample
The study sample was not determined in the planning phase. In addition, no power calculations were conducted retrospectively. Consecutive patients who visited primary care practices between April 1996 and September 1997 were asked to complete a 2-stage screening test for depression. Initially, 653 of the 11,006 people screened were found to be positive and met the study inclusion criteria for enrolment. Of these 653 patients, 174 (26.6%) refused further evaluation. Overall, of the 479 positively screened patients who agreed to be evaluated further, 268 (124 in the enhanced care group and 144 in the usual care group) were excluded because they had been recently treated. Thus, there were 211 participants in the study, 115 in the enhanced care group and 96 in the usual care group.

The study participants were, on average, aged 43.1 years (standard deviation 14.8), 84.4% were female and 15.6% belonged to minority groups. In addition, 47.4% were currently married, 79.2% had a high school education, 62.1% were employed either full-time or part-time, and 82.5% were insured for health care. The patients had an average of 2.1 physical co-morbidities, and they reported an average of 6.4 DSM-III-R depression criteria during the previous 2 weeks. Ten per cent of the patients met dysthymia criteria in the previous year and 73.3% reported a prior incident of depression.

Study design
The analysis was based on a multi-centre (12 primary care practices) randomised controlled trial. Using block-randomisation, the 12 primary care practices were stratified according to baseline pattern characteristics and were matched into 6 blocks according to depression treatment patterns. One practice from each block was randomly assigned to enhanced care. The patients were followed up at 6, 12, 18 and 24 months, through a structured telephone interview conducted by an independent research interviewer blinded to the intervention. Only in 3 cases was the interviewer aware of the type of intervention. The authors reported that the overall response rate was 89.6% at 6 months, 81.5% at 12 months, 72.5% at 18 months and 67.3% at 24 months. In the enhanced care group, 15.6% of the patients were lost to follow-up at 6 months and 40% at 24 months. In the usual care group, 4% of the patients were lost to follow-up at 6 months and 24% at 24 months. The reasons for withdrawals were not provided.

Analysis of effectiveness
The analysis was conducted on an intention to treat basis. The primary outcome was the number of days free of depression during the past 4 weeks. Therefore, the patients were asked to report the number of days in the past 4 weeks during which their emotional problems kept them in bed for the whole or most of the day, or they were unable to perform their usual activities for 1 half-day or more. The authors reported that the patients in the enhanced and usual care groups were comparable in most of their baseline characteristics. The two groups differed significantly in age, depression severity and physical co-morbidity, although appropriate adjustments were carried out for potential confounding factors.

Effectiveness results
The number of days free of depression during the 2-year period was 647.6 days in the enhanced care group versus 588.2 days in the usual care group. (p<0.01).

The bootstrap analysis demonstrated that enhanced care increased incremental days free of depression impairment during the 2 years by 59.4 days (95% confidence interval, CI: 38.0 - 80.7).

The number of incremental days free of depression was higher during the second year than in the first (36.4 versus 23.0 days; p<0.001).

Clinical conclusions
The authors concluded that enhanced primary care management on an ongoing basis was more clinically effective than usual care management, and that the clinical outcomes increased with time.

Measure of benefits used in the economic analysis
The measure of benefits used was the quality-adjusted life-years (QALYs). Most of the utility values were derived from the literature.

For further details on the methods employed to value different health states, the reader is referred to the appendix of the current study and to the Annals of Family Medicine website at the following url:

http://www.annfammed.org/cgi/content/full/3/1/7/DC1)

Direct costs
The categories of costs included were programme costs, outpatient costs, and patient time and transportation. The programme costs covered the time costs of professionals (salary plus fringe) for screening, preparation and delivery of enhanced care, record keeping and review, and care manager-physician communication, and overheads. Outpatient costs covered primary care visits, specialty mental health care visits, emergency department visits and psychotropic medications. Patient time and transportation covered the cost of travel time, and clinic and waiting time for employed patients.

For unemployed patients, the authors used average wage rates for the fiscal year 2000 by gender and education to proxy time costs. The costs and the quantities were only reported separately for programme costs. Resource use associated with the programme was derived from care management logs, while the equivalent costs were obtained from Bureau of Labor Statistics. The remaining resources used were based on patient-reported utilisation. Most of the costs were derived from official published sources. Only the source of transportation costs was not reported. Inpatient costs, productivity costs and non-psychotropic medication costs were excluded from the analysis and a justification for their exclusion was provided. All the costs were appropriately adjusted using the Consumer Price Index and were reported for the price year 2000. Discounting was irrelevant, as the costs were incurred during 2 years, and was omitted.

Statistical analysis of costs
The costs were treated deterministically.

Indirect Costs
The indirect costs were not included in the analysis.

Currency
US dollars ($).

Sensitivity analysis
A sensitivity analysis was conducted, using bootstrap analysis across 1,000 replications, to derive the distribution of QALYs, costs and cost-effectiveness ratios with nonparametric CIs. Also, to create dominance plots and acceptability curves.

Estimated benefits used in the economic analysis
Enhanced care resulted in 0.049 incremental QALYs for the 2-year period in comparison with usual care.

Cost results
Enhanced care resulted in an incremental total cost (programme, outpatient, and patient time and transportation costs) of $701 (95% CI: 637 - 765; t=6.82, p<0.001, d.f.=4.198) in comparison with usual care. It should be noted that the effect of enhanced care on the total costs was significantly stronger during the first year of the programme (incremental cost $675) than during the second year (incremental cost $26), (p<0.001).
Health plan costs (programme and outpatient costs) increased by $556 (95% CI: 500 - 612; f=7.46, p<0.001, d.f.=4,198) more than usual care. The effect of enhanced care on health plan costs was significantly greater in the first year ($568) than in the second (-$12), (p<0.001).

The incremental total medication-adjusted costs (i.e. when the generic price of medications is available) of enhanced care in comparison with usual care was $470 (95% CI: 412 - 527; f=6.23, p<0.001, d.f.=4,198).

The incremental health plan medication-adjusted costs of enhanced care in comparison with usual care was $325 (95% CI: 275 - 374; f=6.86, p<0.001, d.f.=4,198).

**Synthesis of costs and benefits**

The bootstrap analysis demonstrated that enhanced care resulted in a mean incremental cost that ranged from $9,592 (medical-adjusted costs) to $14,306 (non-adjusted costs) per QALY. According to the dominance plot analysis, 88.7% of patients were expected to have superior outcomes with increased cost, while 11.3% were expected to have better outcomes with decreased costs. The acceptability curve analysis demonstrated that there was a 100% probability that the mean incremental cost-effectiveness ratio was less than $20,000 per QALY in all analyses.

**Authors' conclusions**

Incremental quality-adjusted life-years (QALYs) significantly increased with time while incremental costs decreased with time. This implies that, compared with usual care, enhanced care management becomes more effective and less costly with time.

**CRD COMMENTARY - Selection of comparators**

A justification was provided for the comparators used. Usual care seems to have represented current practice in the authors' setting. You should decide if this represents a widely used health technology in your own setting.

**Validity of estimate of measure of effectiveness**

The analysis was based on a multi-centre randomised controlled trial, which was appropriate given the study question. The study sample was representative of the study population. The methods of randomisation, blinding, length of study and loss to follow-up were all reported, suggesting that the internal validity of the study is likely to be good. In addition, an appropriate statistical analysis was undertaken to account for possible biases and confounding factors.

**Validity of estimate of measure of benefit**

The measure of benefit was the health utility (QALYs), but the methods used to derive the health values were not explicitly reported in the current study. It is therefore not possible to comment on the quality of the estimates used.

**Validity of estimate of costs**

The authors reported that a societal perspective was adopted for the cost analysis. However, the indirect costs (i.e. productivity costs) were not reported, as is usual when considering a societal perspective, and no justification for their exclusion was provided. (Note: since this abstract was written the authors have informed us that, notwithstanding the societal perspective adopted in the study, indirect costs were not included because "they are implicitly included in the non-monetized denominator of a QALY estimate", in other words, the inclusion of productivity costs would lead to double counting). The authors also excluded inpatient costs from the analysis because they did not observe between group differences in hospitalisation, which affected only a small proportion of patients. They also excluded non-psychotropic medication costs because they were not available, although their exclusion was unlikely to have affected the results. The costs and the quantities were not reported separately, which would not enable the analysis to be easily reworked for other settings. Resource use associated with the programme was derived from published sources, while remaining resources were based on patient reported utilisation. An extensive statistical analysis was undertaken which may improve the generalisability of the results. The prices were derived from official published sources and were
appropriately adjusted to reflect 2000 prices. This will enhance any future inflation exercises. Since all the costs were incurred during 2 years, the costs were appropriately not discounted.

Other issues
The authors briefly compared their findings with those from other available studies and found consistency in the findings. The issue of the generalisability of the results was directly addressed. The authors do not appear to have presented their results selectively. The study enrolled depressed patients starting on a new episode of treatment, and this was reflected in the authors' conclusions.

The authors reported a number of limitations to the study. First, the three measures of depression-free days used have common characteristics, conceptually and statistically. Using patient-reported health care use is an imprecise method, although the authors reported that it was unlikely to have affected the results. The authors admitted that their analysis was restricted to depressed patients starting on a new episode of treatment because of evidence suggesting that the intervention is not effective for depressed patients who have been treated before.

Implications of the study
The authors suggested "enhancing primary care depression management on an ongoing basis should be considered for adoption by policy and health plan leaders". The authors made various suggestions for future research. In particular, research to develop a brief and valid measure of depression-specific QALYs, and a pre-planned meta-analysis of multiple large trials that estimate hospitalisation costs and which could be included in a future cost-effectiveness analysis. Future research should also investigate various management techniques that increase specialty care consultation or collaboration for patients receiving depression care at baseline and are characterised as a "treatment-resistant cohort".

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