Can a disease self-management program reduce health care costs: the case of older women with heart disease

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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
A self-management programme for older women with heart disease, the "Women Take PRIDE" programme, was examined. The intervention was described in detail in the paper. Its basis lies in the acronym itself:

Problem identification,
Researching one's routine,
Identifying a management goal,
Developing a plan to reach it,
Expressing one's reactions and establishing rewards for goal achievement.

Emphasis is on the long-term management of the patient's heart condition.

Type of intervention
Secondary prevention.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised females, aged 60 years or older, who had been diagnosed with cardiac disease and were seen by a physician approximately every 6 months. Their cardiac disease was treated on a daily basis with at least one medication. Cardiac disease was defined as any condition directly involving the heart (e.g. angina, myocardial infarction, arrhythmia and valvular disease). Patients in whom hypertension was the only diagnosis were excluded.

Setting
The setting was unclear, but it was likely to have been primary care. The economic study was carried out in south-eastern Michigan, USA.

Dates to which data relate
The dates to which the effectiveness and resource use data related were not given. The price year was also not reported.

Source of effectiveness data
The effectiveness evidence was derived from a single study, full details of which were reported elsewhere (Dodge et al. 2002, see 'Other Publications of Related Interest' below for bibliographic details).
Link between effectiveness and cost data
The costing was performed retrospectively from the study sample's hospital billing records.

Study sample
No power calculations were reported. The participants were recruited from six medical centres in south-eastern Michigan by cooperating physicians reviewing lists of potential individuals. Five hundred and seventy (48%) women who were recruited agreed to participate and completed baseline interviews. Twenty-two women died, 69 women withdrew, key data were missing for 2 women, an additional 25 randomised to the intervention failed to attend, and hospital use data were not available for 9 women. This resulted in a study sample of 443 women, 227 in the intervention group and 216 in the control group. The average age of the study sample was 72 years (range: 60 - 93).

Study design
This was a randomised controlled trial (RCT) where the participants were randomised using a random numbers table. In an effort to assure similar care and treatment in both groups, the research staff did not provide any feedback about individual participants to medical personnel at these sites. The study was multi-centred and involved a number of medical centres. Health care resource use and costs were collected retrospectively for 12 months prior to the baseline interview (pre-intervention window), for 3 months following the baseline interview (intervention window), and for 21 months following baseline (post-intervention window).

Analysis of effectiveness
Changes in the utilisation variables (hospitalisations and emergency department visits) pre- and post-intervention were first compared using intention to treat analyses. Subsequent multiple regression analyses investigated the intervention effects adjusted for baseline utilisation, health status, demographic variables and hospital site. There were no differences between the groups at baseline in terms of deaths and drop-out rates, but the intervention group did have a significantly higher number of emergency department visits.

Effectiveness results
The multiple regression analysis found that women in the intervention experienced 46% fewer hospital inpatients days, (p=0.03), 41% fewer heart-related hospital admissions, (p=0.05) and 61% fewer heart-related hospital inpatient days, (p=0.02), than women in the control group.

The RCT also found that, at 12 months' follow-up, women in the intervention group were less symptomatic than those in the control group, (p<0.01) and scored better on the physical dimension of the Sickness Impact Profile, (p<0.01). They also demonstrated improved ambulation, as measured by the 6-minute walk test, (p=0.01), and lost more body weight, (p<0.001).

Clinical conclusions
The programme demonstrated a number of significant health effects.

Measure of benefits used in the economic analysis
The health outcomes were not considered explicitly and no summary benefit measure was produced. In effect, a cost-consequences analysis was performed.

Direct costs
Discounting, although relevant, was not undertaken. Resource use (admissions, inpatient days, emergency department visits) were estimated from hospital records and analysed separately from the costs. The direct costs of delivering the programme were presented separately. These costs were based on the actual time and material costs for conducting 49
sessions during 3 years.

**Statistical analysis of costs**
The costs were treated deterministically. Resource use and costs in the intervention group and control were compared using Wilcoxon's rank-sum testing. The author provided mean values and standard deviations of the cost of hospitalisations and emergency department visits. Multiple regression models were used to investigate the effect of the intervention on health care use. Generalised estimating equations (both Poisson and linear) were employed.

**Indirect Costs**
The indirect costs were not considered in the economic evaluation.

**Currency**
US dollars ($).

**Sensitivity analysis**
Sensitivity analyses were not performed.

**Estimated benefits used in the economic analysis**
Due to the cost-consequences approach taken, please refer to the 'Effectiveness Results' section.

**Cost results**
The average cost of hospitalisation for all diagnoses was $5,434 in the intervention group and $7,582 in the control group, (p non significant).

The average cost of emergency department visits for all diagnoses was $148 in the intervention group and $71 in the control group. This difference was statistically significant, (p=0.04).

The average cost of hospitalisation for heart-related diagnoses was $3,740 in the intervention group and $5,977 in the control group.

The average cost of emergency department visits for heart-related diagnoses was $34 in the intervention group and $2.68 in the control group. This difference was statistically significant, (p=0.04).

The multiple regression analysis found that participants in the programme experienced 46% fewer hospital inpatient days and 49% lower inpatient charges. Given that the average annual per patient inpatient charge was approximately $6,500, inpatient savings associated with programme participation were approximately $3,200. Using a ratio of 0.56 payments to charges, this yielded an estimated saving in payments of about $1,800 per person per year.

The total direct cost of the intervention was $186.50 per participant per 4-week programme.

Adding in overheads was thought to double the direct costs to $374 per participant.

The ratio of expenditure savings ($1,800) to programme costs ($374) was approximately 5 to 1.

**Synthesis of costs and benefits**
The costs and benefits were not combined as a cost-consequences analysis was conducted.

**Authors' conclusions**
The "Women Take PRIDE" programme can have significant net positive monetary consequences for a service provider or insurer. The results suggested that rewards for such coverage would accrue to health plans and providers. The fact that the programme produced improvements in the health of its participants reinforces the argument that fiscal support or such efforts is warranted.

**CRD COMMENTARY - Selection of comparators**

Although no explicit justification was given for the comparator used, it appears to have been representative of current practice in the absence of any self-management programme. You should decide if the comparator represents current practice in your own setting.

**Validity of estimate of measure of effectiveness**

The analysis of effectiveness was reported elsewhere. The study was a randomised trial, which was appropriate for the study question. The methods of sample selection and randomisation were reported. Sample size calculations were not reported, but the participation rate was consistent with other investigations of older populations. There was no discussion about whether the study sample was representative of the study population, although the demographics and descriptive statistics of the study sample were reported. The patient groups were shown to be comparable in terms of drop-out rates and deaths, although the intervention group was found to have greater numbers of emergency department visits and costs than the control group. Multiple regression models, which estimated the effects of programme participation on hospital health care use, appropriately controlled for differences in baseline utilisation, health status, demographic variables and hospital site.

**Validity of estimate of measure of benefit**

No summary benefit measure was used in the analysis as a cost-consequences analysis was conducted. The comments in the 'Validity of estimate of measure of effectiveness' field (above) therefore apply.

**Validity of estimate of costs**

The analysis was conducted from the perspective of the hospital. As such, all the relevant costs were included. The author acknowledged that the actual costs of hospital use from institutions outside of the primary hospital site were not included, as this was deemed to be too difficult. The author also acknowledged that participation in the programme imposed some costs relating to participation that were not included in the analysis. For example, the value of time spent in the education sessions and at home following the regimen. The author argued that these participant costs were minimal in comparison with the potential benefits. However, this statement requires further supporting evidence and justification. The details of the cost analysis were limited, the price year was not given and the costs do not appear to have been, even though the "postintervention window" extended to 21 months from the "intervention window", in other words 24 months from baseline.

**Other issues**

The author compared the results of the study with those of others. The issue of generalisability was addressed in that the results may not be generalisable to ethnic minority women, or to women with limited education or income. The author acknowledged in his discussion that a limitation of the study was that it was not a true cost-effectiveness analysis of the self-management programme, as it did not compare the full benefits of the programme with the cost of the programme. Notwithstanding this, the paper, and hence this abstract, may still be of some use to decision-makers and others. Thus, the changes in hospitalisations and emergency department visits have been taken as proxies for effectiveness.

**Implications of the study**

The study results suggested that cost-savings are possible if a self-management programme for heart disease sufferers were to be introduced. Further research, in the form of a full cost-effectiveness analysis, is warranted. This need to determine if such cost-savings are complemented by improvements in health status and are sustained in the long term.
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Other publications of related interest


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