Reducing need and demand for medical services in high-risk persons: a health education approach
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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
Implementing a health education programme (involving the use of a graphic summary of the participants' individual health risk problems; subsequent progress; and books, audiotapes, and videotapes) designed to increase self-efficacy, induce specific behavioural change (plus specific goals for each of the 12 educational module programmes involved), and reduce medical use. The programme was aimed at high-risk individuals and involved the use of twelve high-risk module programmes.

Type of intervention
Primary and secondary prevention.

Economic study type
Cost-effectiveness analysis.

Study population
The study population included unscreened individuals and individuals at high-risk for arthritis, back pain, high blood pressure, diabetes mellitus, heart problems, smoking, obesity, stroke, chronic obstructive pulmonary disease, alcohol intake, and combined risk.

Setting
Primary care. The economic study was carried out in California, USA.

Dates to which data relate
Effectiveness and resource use data refer to the same period of time, but the authors gave no year. Cost data refer to 1994.

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

Link between effectiveness and cost data
Costing was prospectively performed on the same patient sample as that used in the effectiveness analysis.

Study sample
Power calculations were not used to determine the sample size. The high-risk group consisted of 2,586 patients (with a mean age of 49.7 years) identified by developing an algorithm using a multiple regression model and a data bank of 24,626 subjects from the Healthtrac and Senior Healthtrac programmes. The subgroups (eight of 12 for which data on
100 or more subjects were available) of high-risk group assigned to a specific high-risk educational module were as follows:

- arthritis (n=297 with a mean age of 65.9 years),
- back pain (n=472 with a mean age of 46.3 years),
- high blood pressure (n=378 with a mean age of 54.3 years),
- combined risk (n=576 with a mean age of 41.5 years),
- diabetes mellitus (n=146 with a mean age of 55.5 years),
- heart problems (n=160 with a mean age of 55.5 years),
- smoking (n=200 with a mean age of 39.7 years), and
- weight loss (n=314 with a mean age of 40.7 years).

Two convenience samples consisted of a group of comparison employees (n=50,576) with a mean age of 41.2 years participating in the standard Healthtrac programme and a group of comparison seniors (n=39,076) with a mean age of 73.3 years.

**Study design**
The study was a prospective cohort, carried out in a single centre. Duration of follow-up was 6 months. Loss to follow-up was not reported. The cycle considered for the high-risk module was 3 months and 6 months for the standard programme, involving issuing a questionnaire, a letter, a report, and health education material during each cycle.

**Analysis of effectiveness**
The principle (intention to treat or treatment completers only) used in the analysis of effectiveness was not explicitly specified. The clinical outcome measures were global health scores using a horizontal analogue scale, and health risk score using algorithms based on the Framingham and other established risk factor models. The process of data collection involved the use of a self-reported health assessment questionnaire at baseline and at six months.

**Effectiveness results**
The change in global health score compared to baseline over six months was -2% in the overall high-risk group, -2.5% in the comparison employee group, and -3% in the comparison senior group.

For the 8 high-risk subgroups the changes for the various modules were as follows:

- arthritis, -7.5%,
- back pain, -3.1%,
- high blood pressure, -6.3%,
- combined risk, +5.5%,
- diabetes mellitus, -6.1%,
- heart problems, -12.4%,
- smoking, +2.3%,
weight loss, +3.4%.

The improvement in health risk score compared to baseline over six months was 11% in the overall high-risk group, 8.8% in the comparison employee group, and 5.7% in the comparison senior group, (p<0.1) for differences between all three groups.

The corresponding values for the 8 high-risk subgroups were:

- arthritis, 7.7%,
- back pain, 7.8%,
- high blood pressure, 10.7%,
- combined risk, 17.9%,
- diabetes mellitus, 6.0%,
- heart problems, 9.2%,
- smoking, 7.3%,
- weight loss, 7.8%.

**Clinical conclusions**

These results support the hypothesis that greater programme benefits may accrue to health education programmes targeted at high-risk populations.

**Measure of benefits used in the economic analysis**

No summary benefit measure was identified in the economic analysis, and only separate clinical outcomes were reported.

**Direct costs**

Costs were not discounted due to the short time frame of the study. Quantities were reported separately from the costs. Cost items were reported separately. Cost analysis covered the costs of physician visits (including visits plus laboratory tests, x-ray tests, and drugs), and hospital days. The cost per participants per six months was also reported for the health programmes involved. The perspective adopted in the cost analysis was not explicitly specified. Charge data were used to translate the resource use data into corresponding costs. The source of the resource use data was a self-reported questionnaire at baseline and at six months. The estimation of the imputed costs for physician visits and hospital days was based on claims data for similar groups of patients in 1994. The date of the price data was 1994.

**Statistical analysis of costs**

Two-tailed t tests were used to compare the groups in terms of direct costs and total costs.

**Indirect Costs**

Indirect costs were not discounted due to the short time frame of the study. Costs/quantities were reported separately. Indirect cost analysis covered the costs of days sick or confined to home. The source of the sick day data was a self-reported questionnaire completed at baseline and at six months. It is not clear how the cost per day was identified. The date of the price data was not explicitly specified.
Currency
US dollars ($).

Sensitivity analysis
Not conducted.

Estimated benefits used in the economic analysis
Not applicable.

Cost results
The percentage reduction (absolute change) in direct costs over six months compared to baseline was 27% ($304) in the overall high-risk group, 16% ($57) in the comparison employee group, and 7% ($70) in the comparison senior group, (p<0.01) for differences between all three groups.

The corresponding values for the 8 high-risk subgroups were:
- arthritis, 21% ($235),
- back pain, 22% ($224),
- high blood pressure, 39% ($296),
- combined risk, 26% ($230),
- diabetes mellitus, 2% ($39),
- heart problems, 61% ($1,643),
- smoking, 11% ($107) (increase in costs),
- weight loss, 51% ($543).

The percentage reduction (absolute change) in total costs over six months compared to baseline was 25% ($484) in the overall high-risk group, 13% ($87) in the comparison employee group, and 9% ($120) in the comparison senior group, (p<0.1) for differences between all three groups.

The corresponding values for the 8 high-risk subgroups were:
- arthritis, 17% ($295),
- back pain, 17% ($354),
- high blood pressure, 23% ($246),
- combined risk, 32% ($550),
- diabetes mellitus, 5% ($129),
- heart problems, 61% ($2,233),
- smoking, 7% ($143),
- weight loss, 42% ($753).
Synthesis of costs and benefits

Costs and benefits were not combined since the use of the high-risk educational programme was the dominant strategy.

Authors' conclusions

Effective health education programmes can result in larger changes in use and costs in high-risk persons than in unscreened persons, justifying more intensive educational interventions in high-risk groups.

CRD COMMENTARY - Selection of comparators

A justification was provided for the choice of the comparator. You, as a database user, should consider whether this is a widely used health technology in your own setting.

Validity of estimate of measure of benefit

The internal validity of the effectiveness results cannot be guaranteed due to the observational nature of the study design, as acknowledged by the authors. Also, dependent variables were obtained by self report. The study was a cost-consequences analysis.

Validity of estimate of costs

Quantities were reported separately from costs. Insufficient details of methods of cost estimation were given. Charges were used instead of real costs. 'Days sick or confined to home' were also included in the analysis, although some details on the method of cost estimation could have been provided. Cost results may not be generalisable to other settings or countries.

Other issues

The results need to be treated with a degree of caution given the limitations of the study design and lack of sensitivity analysis. The issue of generalisability to other settings or countries was not addressed. Appropriate comparisons were made with other studies.

Implications of the study

An increase in the intensity of an intervention for those at high risk seems an appropriate strategy. As acknowledged by the authors, further studies might choose to investigate the effect of health care programmes over longer periods of time.

Source of funding

None stated.

Bibliographic details


PubMedID

9795579

Indexing Status

Subject indexing assigned by NLM

MeSH

Adult; Aged; Health Behavior; Health Promotion; Health Services Needs and Demand; Humans; Middle Aged; Risk
Assessment

AccessionNumber
21998001612

Date bibliographic record published
31/08/2000

Date abstract record published
31/08/2000