Long term effects and costs of brief behavioural dietary intervention for patients with diabetes delivered from the medical office

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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
Brief behavioural dietary intervention were compared to usual care for patients with diabetes. A single session intervention provided a set of services. These included identifying the key barriers to dietary self-management based on immediate feedback resulting from a touchscreen computer-assisted assessment, goal setting and problem-solving counselling, followed by follow-up calls and videotape intervention at regular intervals. The usual care was high quality care but lacked the focus on behavioural or psychological aspects relating to dietary behaviour.

Type of intervention
Secondary prevention.

Economic study type
Cost-effectiveness analysis.

Study population
The study population consisted of patients aged 40 years or older, with type I or type II diabetes, who practised dietary self-management.

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

Dates to which data relate
The dates of effectiveness, resource, and price data were not specified.

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

Link between effectiveness and cost data
The costing was undertaken prospectively on the same sample patient as that used for effectiveness analysis.

Study sample
Power calculations were not used to determine the sample size. 206 patients were randomly assigned: the brief intervention group received 108 patients and the usual care group received 98. Thirty nine percent of eligible patients refused to participate in the study.
Study design
The study was a randomised controlled trial. The duration of the follow-up was 1 year. The overall withdrawal rate was 16% (16.7% for the intervention group and 15.3% for the control group).

Analysis of effectiveness
The analysis of the clinical study was based on treatment completers only. Three sets of health measures were utilized in the study: dietary measures, physiologic measures, and patient satisfaction measures. Dietary measures consisted of the Kristal Food Habits Questionnaire (FHQ) and a four-day food record used to produce scores based on Kilocalories consumed per day, fat consumption (percent of calories from fat), and saturated fat consumption (percent of calories from saturated fat). The physiologic measures included body mass index (BMI), serum cholesterol, and a measure of long term glycemic control (HbA1c). Multivariate analyses of covariance (MANCOVA) and follow-up analyses of covariance (ANCOVA) were performed to assess the effects of the intervention at the one-year follow-up. A special measure was developed to assess patient satisfaction, however no details of this measure were given. The groups were shown to be comparable in terms of demographic characteristics and medical history. The effects of confounding variables such as the health care providers (physicians or interventionists) were investigated by applying analyses of covariance.

Effectiveness results
There were no baseline differences in terms of the health measures between the alternative groups. The study revealed that according to the overall MANCOVA for dietary and physiologic measures, the improvement in the brief intervention group was significantly higher than in the usual care group (p=0.008). Follow-up ANCOVAs showed that the improvement was significant on each of four components of dietary measures, and on only one component of the physiologic measures: serum cholesterol. In the brief intervention group covariate-adjusted follow-up differences in calories from fat were 2.2% (p=0.023), and in serum cholesterol were 15mg/dl (p=0.002).

At the one-year follow-up the scores were:

(1) food habits questionnaire score: reduced from 2.26 to 2.06 (p=0.007) for the intervention group versus 2.20 to 2.17 for the usual care group;

(2) Kcal consumed per day was reduced from 1740 to 1547 (p= 0.05) for the intervention group versus 1761 to 1659 for the usual care group;

(3) fat consumption was reduced from 33.8% to 30.5% (p=0.023) for the intervention group versus 32.9% to 32% for the usual care group;

(4) saturated fat consumption was reduced from 11.2% to 9.7% (p=0.003) for the intervention group versus 10.8% to 10.7% for the usual care group;

(5) serum cholesterol level was reduced from 217 mg/dl to 208 mg/dl (p=0.002) for the intervention group versus 223 mg/dl to 226 mg/dl for the usual care group.

The differences in BMI and HbA1c were not significant.

Patient satisfaction was significantly higher in the brief intervention group than in the usual care group (p<0.02).

Clinical conclusions
The study revealed that the brief intervention had significantly higher long-term impacts on dietary behaviours, serum cholesterol level, and patient satisfaction than the usual care in patients with diabetes.

Measure of benefits used in the economic analysis
A single measure of benefit was not produced within the economic evaluation.
Direct costs
Resource quantities were not reported separately. The costs of the brief intervention were reported separately. The study focused on reporting the incremental costs of the brief intervention above the costs of the usual care strategy. The intervention costs were divided into the costs of the touch screen computer package, materials and supplies, labour, postage, and long distance phone calls. The costs were calculated from the perspective of a health care organisation. The calculation of the costs was based on the actual data. Based on this data, the study estimated the cost components of the brief intervention for two scenarios in which the number of patients per year were 500 and 1,000. The date of the price data was not specified. The costs of developing the touch screen computer intervention materials, the costs of facility space, and labour costs for training were not included in the study.

Indirect Costs
Not reported.

Currency
US dollars ($).

Sensitivity analysis
No sensitivity analysis was carried out.

Estimated benefits used in the economic analysis
Not applicable.

Cost results
The total incremental cost per patient for the brief intervention was $137. In the scenarios with 500 and 1000 patients, the corresponding figures were $117 and $115, respectively.

Synthesis of costs and benefits
An incremental cost per measure of production was calculated for fat consumption, saturated fat consumption, and serum cholesterol. The incremental cost per percent reduction in dietary fat was $62, and for the two scenarios with 500 and 1,000 patients were $53 and $52. The incremental cost per percent reduction in saturated fat was $108. The incremental cost per unit reduction in cholesterol was $8 and for the two scenarios with 500 and 1,000 patients were $7.11 and $6.95, respectively.

Authors' conclusions
The brief intervention was successful in producing long-term impacts on both dietary behaviours and serum cholesterol levels at one year follow-up. The [incremental] costs of intervention ($137 per patient) were modest relative to many commonly used practices.

CRD COMMENTARY - Selection of comparators
The reason for the choice of the comparator is clear. You should consider whether this is a widely used health technology in your own setting.

Validity of estimate of measure of benefit
The estimate of the benefits is likely to be internally valid because of randomisation and controlling for the effects of potential confounding variables.
Validity of estimate of costs
Resource quantities were not reported separately from the costs. Adequate details of cost estimation were not given, no statistical analysis of costs was carried out.

Other issues
The issue of the generalisability of the results to other settings or countries was not addressed. Lack of sensitivity analysis may have adverse effects on the generalisability of the results to other settings or countries. The cost-effectiveness study was based on intermediate health outcomes, and further studies are needed in which endpoints are taken into consideration.

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