A video lesson series is effective in changing the dietary intakes and food-related behaviors of low-income homemakers

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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 use of a series of video lessons to change the dietary intakes and food-related behaviours of low-income homemakers. The individuals receiving video lessons were provided with videotaped lessons with handouts, accompanied by intermittent telephone discussions. The video series consisted of 12 videotapes based on the Eating Right is Basic Series, 3rd Edition (ERIB-3). The participants received three lessons per month and were instructed to watch one video per week, review handouts, and try some of the recipes and learning activities. This intervention was then compared with the traditional intervention, whereby individuals received lessons via one-on-one instruction in the home, or in small neighbourhood groups of 9 to 10 members.

Type of intervention
Other: Education programme.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised young, low-income families. A young family was defined as one in which the homemaker is in the childbearing stage, or there is a dependent child younger than 18 years old living in the house. The inclusion criteria specified nonpregnant adult females on a low income (150% of poverty or less), who had a video cassette recorder (VCR) and a telephone in the house.

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

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

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

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

Study sample
No power calculations to determine the sample size were reported and no specific sample size was planned. The study enrolled 108 individuals, from which 66 were recruited to the control group and 42 to the video group. Of the 108 recruited, 93 completed the intervention and pre- and post-assessment, thus yielding a completion rate of 86%. Of the 93 individuals completing the study, 53 (57%) were white and 40 (43%) were African American. The mean age was 28 (+/- 8) years (range: 15 - 52).

**Study design**

The basis of the study was a quasi-experimental design. Attempts were made to randomly assign the participants to either the control group or the video group. Identification numbers were assigned on enrolment, then those with even numbers were placed in the traditional group and those with odd numbers were placed in the video group. However, adjustments were made for any participants who had strong preferences on the type of lesson to be followed. Both groups were followed for 12 months. Ninety-three (86%) of the 108 individuals recruited completed the intervention. Of the 15 (14%) who dropped out, 6 were from the control group and 9 from the video group. The reasons for discontinuation included onset of pregnancy (n=2), malfunctioning or loss of VCR (n=3), desire to switch from video to traditional lessons (n=4), getting a job (n=2), and inadequate representation in the sample (n=4).

**Analysis of effectiveness**

The analysis of the clinical study was conducted on the basis of treatment completers only. The outcomes assessed were:

- food intake, as analysed by the number of servings from the fruit, vegetable, dairy, and fats or sweets groups of the Food Guide Pyramid;
- the intake of micronutrients tending to be low in this population's diet (iron, calcium, and vitamins A and C);
- the intake of fat as a percentage of energy; and
- changes related to food safety, meal preparation and nutrition behaviour, as measured by the first 14 items of the 23-item Pennsylvania State Behavior Checklist (PSBC).

In the PSBC, the items were scored using a 4-point Likert scale. The means of item scores were summed to give an overall checklist score. Four points were awarded for an item with a desirable response of "always" or an undesirable response of "never" performed.

Due to large numbers of missing responses, three items were eliminated from the multivariate analysis of variance in comparing the two groups. These items dealt with certain food safety practices and running out of food. Only 19 participants in the video group and 26 in the traditional group had complete data for the remaining items and were included in the analysis. Based on a chi-squared analysis, the two groups did not differ significantly at baseline in terms of their age, (p=0.7086), educational level, (p=0.9350), or income, (p=0.6107). The t-tests indicated significant differences in the two groups pre intervention for three nutrients, with the video group having significantly lower intakes of calcium, vitamin A and vitamin C. However, the two groups were not shown to be significantly different for overall scores on the PSBC.

**Effectiveness results**

After the intervention, both groups had significantly improved intakes for fruits, calcium, and vitamins A and C. The video group also had a significantly improved intake of dietary fibre.

The mean difference in the pre to post number of fruit servings was 1.59 (+/- 0.36) for the control group, (p<0.0001), and 1.12 (+/- 1.87) for the video group, (p<0.0001).

The mean difference in pre to post intake of calcium as a percentage of the dietary reference intake was 20.12 (+/- 30.59) for the control group, (p<0.0001), and 24.21 (+/- 37.68) for the video group, (p=0.0007).
The mean difference in pre to post intake of vitamin A as a percentage of the dietary reference intake was 15.17 (+/- 34.67) for the control group, (p=0.0011), and 34.54 (+/- 36.37) for the video group, (p<0.0001).

The mean difference in pre to post intake of vitamin C as a percentage of the dietary reference intake was 18.40 (+/- 31.26) for the control group, (p<0.0001), and 32.26 (+/- 39.89) for the video group, (p<0.0001).

The mean difference in pre to post intake of fibre as a percentage of the dietary reference intake was 27.76 (+/- 46.51) for the video group, (p<0.0033).

Both groups also improved significantly on the PSBC scores. The mean difference in pre to post PSBC total scores was 0.42 (+/- 0.40) for the control group, (p=0.0001), and 0.53 (+/- 0.65) for the video group, (p=0.0001).

A multivariate analysis of variance conducted across all dietary variables and across all PSBC scores revealed no significant differences between the two groups in the amount of change in dietary intakes, or the change in food-related behaviours.

Clinical conclusions
Both traditional lessons and video lessons were effective in promoting dietary and other behaviour change. The video lessons positively affected more dietary factors than the traditional lessons.

Measure of benefits used in the economic analysis
No summary measure of benefit was derived. The study was effectively a cost-consequences analysis.

Direct costs
The resource use and costs were not reported separately. The direct costs to the institution carrying out the educational interventions were included in the analysis. These comprised the annual costs of paraprofessional time and mileage for lesson delivery, the costs of purchasing flipcharts and video masters, duplication of the videos, and the telephone service. The original cost of developing the video was not included. In-kind costs such as office space and salaries of support staff were not included, as these would not differ according to the delivery method.

Mileage for lesson delivery was calculated using a typical graduation rate of 72 homemakers per programme assistant (PA). The cost per PA was derived on the basis of 1996 data from Virginia. The costs of flip charts and handouts were based on Michigan State Extension Material Order Forms. The cost of duplicating videos was derived from the Virginia Polytechnic Institute and State University Broadcasting Services. The costs of telephone services referred to the cost of unlimited local business service with Bell Atlantic. Discounting was unnecessary since all the costs were incurred during one year, and was not performed. The costs were reported as the mean cost required for one PA to deliver 12 lessons to 72 homemakers.

Statistical analysis of costs
The costs were treated as point estimates (i.e. the data were deterministic).

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

Currency
US dollars ($).

Sensitivity analysis
No sensitivity analysis was performed.

**Estimated benefits used in the economic analysis**
See the "Effectiveness Results" section.

**Cost results**
The mean cost required for one PA to deliver 12 lessons to 72 homemakers was $13,463 using traditional lessons and $4,820 using video lessons.

**Synthesis of costs and benefits**
The costs and benefits were not combined.

**Authors’ conclusions**
The effectiveness and lower cost associated with the video method indicated that video lessons were a cost-effective and feasible means of delivering nutrition education to some low-income individuals.

**CRD COMMENTARY - Selection of comparators**
A justification was given for using one-to-one instruction as the comparator. It represented current practice in the authors’ setting. You should decide if the comparator represents current practice in your own setting.

**Validity of estimate of measure of effectiveness**
The basis of the analysis was a quasi-randomised controlled trial. However, the randomisation was seriously compromised, as it was adjusted to allow for individuals with strong preferences on the type of lesson to be followed. Further, the initial method of randomisation was unclear. The authors explicitly reported that the study participants were typical of the study population. The patient groups were shown to be comparable in terms of their age, educational level and income. However, they were not comparable in terms of calcium, vitamin A and vitamin C intake at baseline, with the video group having lower intakes than the control group. All the differences between pre and post intervention and between groups were tested for statistical significance using appropriate statistical techniques. However, the outcomes were analysed on the basis of treatment completers only.

**Validity of estimate of measure of benefit**
The authors did not derive a summary measure of health benefit. The analysis was, in effect, a cost-consequences analysis.

**Validity of estimate of costs**
All the categories of cost relevant to the perspective adopted were included in the analysis, although some relevant costs were omitted from the analysis. Costs such as office space and salaries of support staff were not included, as these would be the same irrespective of the delivery method. The authors also omitted from the analysis the original costs of developing the videos. However, the cost-difference between the two interventions was such, that it was unlikely that this omission would have altered the authors’ conclusions. The costs and the quantities were not reported separately, which will limit the generalisability to other settings. No statistical analysis of the costs was undertaken, although the costs between the two interventions were so different that this difference is very likely to be statistically significant. Discounting was unnecessary since all the costs were incurred during one year. The dates to which the prices related were not reported, which will hamper any possible future inflation exercises.

**Other issues**
The authors made appropriate comparisons of their findings with those from other studies that also found that both types of lessons (traditional and video) resulted in substantial improvements in food behaviour. The authors did not address the issue of generalisability to other settings. The authors do not appear to have presented their results selectively and their conclusions reflected the scope of the analysis. No further limitations of the study were reported.

**Implications of the study**
Due to the growing availability of home Internet access, the authors suggested that it might be feasible to load video lessons on a web site for ease of delivery, thus eliminating the costs of duplicating and replacing videos. However, they also reported that this would require further investigation.

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