Breastfeeding duration, costs, and benefits of a support program for low-income breastfeeding women

Pugh L C, Milligan R A, Frick K D, Spatz D, Bronner Y

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 health technology examined in the study was a community health nurse/peer counsellor intervention intended to increase the duration of breastfeeding among low-income women during the first six months after delivery of a full-term singleton infant. The intervention consisted of usual breastfeeding support (support from hospital nurses, assistance by means of a telephone "warm line", and one hospital visit by a lactation consultant if the participant delivered on a weekday); supplementary daily visits during hospitalisation; visits at home during weeks 1, 2, and 4 and at the team's discretion; in addition, peer counsellors provided telephone support twice weekly through week 8 and weekly through month 6.

Type of intervention
Primary prevention.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised low-income women who had just delivered a full-term singleton infant. The women were receiving financial medical assistance.

Setting
The setting was primary care at an academic medical centre. The economic study was carried out in the United States.

Dates to which data relate
Data on effectiveness and resource use were gathered from April 1999 to February 2000. The price year was not explicitly reported.

Source of effectiveness data
The effectiveness evidence was derived from a single study.

Link between effectiveness and cost data
The costing was conducted prospectively on the same sample of patients as that used in the effectiveness study.

Study sample
Power calculations were not conducted. A sample of 41 women was enrolled: 21 women (mother's mean age: 20.86 +/- 3.58 years; 95.2% African American; 81% single) were included in the intervention group and 20 women (mother's
mean age: 22.35 +/- 4.98 years; 90% African American; 100% single) in the control group. The method of sample selection was not reported and it was not stated whether some women refused to participate or were excluded from the study sample for any reason.

Study design
This was a community-based, prospective, randomised controlled trial, which was conducted in a single centre (a large academic medical centre). Subjects were allocated to study groups using a sealed envelope technique. The length of follow-up was six months and no loss to follow-up was reported. No blind assessment was conducted. Women were contacted by telephone at least every two weeks and infant data outcomes were collected at months 3 and 6 in person and by telephone at post-partum weeks 1, 2, 3, 4, and 6, and month 4.

Analysis of effectiveness
It appears that all patients included in the initial study sample were taken into account in the effectiveness study. The main health outcome used in the analysis was breastfeeding duration. At baseline, intervention and control group subjects were comparable with respect to age, ethnicity, education, marital status, and breastfeeding goals.

Effectiveness results
After one week, more intervention than control subjects were breastfeeding.

At three months, 45% of intervention mothers were exclusively breastfeeding versus only 25% of control mothers, while at six months, 30% of intervention and 15% of control mothers were breastfeeding.

At six months, partial breastfeeding was still carried out by 45% of intervention mothers versus 35% of control mothers.

Clinical conclusions
The effectiveness analysis showed that the community health nurse/peer counsellor intervention was effective in improving breastfeeding among low-income mothers after delivery.

Measure of benefits used in the economic analysis
Health outcomes were left disaggregated and no summary benefit measure was used, thus a cost-consequences analysis (CCA) was conducted.

Direct costs
The cost categories included in the analysis were health service costs and patient costs. The health service costs were calculated in two ways. The first calculation was based on reported and attempted contacts between the community health nurse/peer counsellor and the participants, and community health nurses' and peer counsellors' salaries as well as standard mileage estimates were considered (this approach underestimated true programme costs because training expenses were not included); the second calculation used project records of what staff members were paid for time dedicated to training and in-service education (this approach overestimated costs because training time was increased for research purposes).

Discounting was not relevant as costs per patient were incurred over a period of six months. Unit costs were analysed separately from quantities of resources used only for some items. The estimation of resource use was based on data prospectively collected alongside the clinical trial.

For patient costs, the prices of formula milk (cans of concentrate and/or powder) were obtained in November 1999 from a web site for a national drug store and lowest values were used. The price year was not explicitly reported.
The number of total visits, checkups, sick visits, prescriptions, immunisations, emergency department (ED) visits, and total hospitalisations per infant were also reported but no costs were attached to such resources.

**Statistical analysis of costs**
Costs were treated in a descriptive manner as average values and standard deviations. However, a statistical test was conducted on resources used for infants (on which no costing was performed).

**Indirect Costs**
Indirect costs were included in the analysis to assign a monetary value to the time spent for (breast- and bottle-) feeding. Resource use data were based on subjects’ self-reported information while unit costs were based on actual data coming from average wages reflecting the reported occupations (using data from the National Compensation Survey) and average weekly earnings for those who were still in school or did not report an occupation. The price year was not reported. Discounting was not required due to the short time frame of the analysis. Unit costs were not analysed separately from quantities of resources used.

**Currency**
US dollars ($).

**Sensitivity analysis**
Sensitivity analyses were not conducted.

**Estimated benefits used in the economic analysis**
Please refer to the effectiveness results reported above.

**Cost results**
The average direct cost per mother was $739 +/- $77 in the intervention group and $685 +/- $75 in the control group (difference: $54 +/- $107).

The average indirect cost per mother was $3,101 +/- $173 in the intervention group and $2,509 +/- $188 in the control group (difference: $592 +/- $255). As a result, the total costs per mother were $3,840 +/- $202 in the intervention group and $3,194 +/- $149 in the control group (difference: $646 +/- $251).

With respect to resources used per infant, in the intervention and control groups, there were 3.6 +/- 0.28 versus 5 +/- 0.53 total visits, (p<0.05); 3.15 +/- 0.26 versus 3.8 +/- 0.36 checkups; 0.45 +/- 0.15 versus 1.2 +/- 0.33 sick visits; 0.25 +/- 0.12 versus 0.85 +/- 0.27 prescriptions, (p<0.05); 2.35 +/- 0.15 versus 2.35 +/- 0.29 immunisations; 0.6 +/- 0.17 versus 0.7 +/- 0.23 ER visits; and 0.15 +/- 0.15 versus 0.15 +/- 0.11 total hospitalisations.

**Synthesis of costs and benefits**
A synthesis of costs and benefits was not relevant as a CCA was conducted.

**Authors' conclusions**
The authors concluded that the support programme was effective as women with the intervention breastfed longer than those in the control group and intervention infants consumed fewer medical care resources than control infants. Despite the small sample, the intervention has the potential to be cost-effective.

**CRD COMMENTARY - Selection of comparators**
The rationale for the choice of the comparator was clear. The pattern of care usually carried out for women who had just delivered was selected to reflect standard care. You should decide whether it represents a valid comparator in your own setting.

**Validity of estimate of measure of effectiveness**
The effectiveness analysis was based on a randomised study, which was appropriate for the study question. The method used to allocate women to study groups was reported and all patients included in the initial study sample appear to have been considered in the effectiveness analysis as no loss to follow-up was reported. The timing for outcome assessment was described and study groups were comparable at baseline. However, the main drawback of the study was the small sample size and the fact that power calculations were not conducted to determine the appropriate sample size. This represents a major limitation to the internal validity of the analysis and caution is required when interpreting the differences observed between the two study groups in terms of the main outcome measure. Further limitations to the validity of the study were as follows: use of data coming from a single centre (a large academic institution); the method of sample selection was not described; and the use of a single outcome measure.

**Validity of estimate of measure of benefit**
No summary benefit measure was used in the analysis because a CCA was conducted. Thus, please refer to the commentary reported above (validity of estimate of measure of effectiveness).

**Validity of estimate of costs**
The perspective adopted in the study was that of society, which was implicitly adopted as the authors attempted to capture all costs related to the breastfeeding support programme. However, only the costs associated with the programme and the use of formula feeding were included in the analysis. Infant-care-related resource use was estimated, but no costing was conducted. Thus, the authors acknowledged that the feeding programme had beneficial effects on the consumption of resources for infants’ care but did not estimate the monetary impact of the programme on such resources. Unit costs and quantities of resources used were only analysed separately with respect to formula costs. Unit costs related to the support programme (personnel time) were not reported. The source of cost data was provided for all cost items. The price year was not given, thus making reflation exercises in other settings difficult. Statistical tests were conducted on resources used but the small sample size cast doubts on the meaning of such comparisons due to the large values of standard deviations.

**Other issues**
The authors did not compare their findings with those from other studies and did not address the issue of the generalisability of the study results to other settings. Sensitivity analyses were not conducted and cost estimates were specific to the study setting. Thus, the external validity of the analysis was low. The authors acknowledged that the small sample size represented a limitation of their analysis.

**Implications of the study**
The study results suggest that the breastfeeding support programme is worthy of the attention of public health care authorities. The authors note that future studies should investigate the economic implications of the programme and use a more reliable approach for the estimation of both direct and indirect costs.

**Source of funding**
Funded by the National Institute of Nursing Research, Bethesda, Maryland (R55 NR04958).

**Bibliographic details**