A competency based approach to comprehensive pregnancy care

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 intervention examined in the study was the Comprehensive Pregnancy Program (CPP). This was based on explicit and achieved patient competencies, and was aimed at reducing the length of stay for pregnant women and their newborns. A Delphi panel approach involving senior experienced perinatal clinicians was used to define three major competencies. These were the provision of a safe environment, making lifestyle changes, and building emotional attachments.

Type of intervention
Other: educational programme.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised pregnant women and their newborns.

Setting
The setting was a hospital. The economic study was carried out at the Department of Obstetrics and Gynecology of the University of Michigan Health System in Ann Arbor (MI), USA.

Dates to which data relate
The effectiveness and resource use data were gathered from September 1995 to January 1996 for the control group, and from February 1996 to June 1996 for the intervention group. The price year was not reported.

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

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

Study sample
Power calculations to determine the sample size were not performed. All eligible women discharged from the study hospital over the two study periods were enrolled in the analysis. There were 705 women and their newborns in the intervention group, and 722 women and their newborns in the control group.
Study design
This was a retrospective case-control study that was carried out in a single centre. The length of follow-up was not reported, but 58% of patients in the intervention group and 56% of those in the control group replied to the questionnaire sent to assess satisfaction.

Analysis of effectiveness
In relation to the analysis of effectiveness (intention to treat versus treatment completers only), it appears that all of the patients included in the initial study groups were considered in the effectiveness analysis, but the analysis was limited to patients who replied to the questionnaire when estimating satisfaction. The primary health outcomes estimated were readmissions, length of stay, and emergency room (ER) visits after birth discharge. All outcomes were estimated for the mothers and newborns separately. The comparability of the study groups was not mentioned.

Effectiveness results
For mothers, the number of readmissions was 19 in both groups.

Days to readmission were 10.6 in the control group and 8.1 in the intervention group.

Readmission length of stay was 4.3 days (control) and 4.0 days (intervention), respectively.

ER visits after birth discharge were 9 (control) and 4 (intervention).

The average number of days to ER visits was 12.7 (control) and 10.3 (interventions).

For newborns, the number of ER visits or readmissions was 94 in the control group and 59 in the intervention group.

The readmissions were 22 (control) and 12 (intervention), respectively.

The average days to readmissions were 14.5 (control) and 7.5 (intervention).

The average readmission length of stay was 4.2 days (control) and 3.4 days (intervention).

The number of ER visits after birth discharge was 72 (control) and 47 (intervention).

The days to ER visits were 13.2 (control) and 11.9 (intervention).

None of the differences achieved statistical significance. For the questionnaire, the authors stated that patient satisfaction was similarly high in both study groups.

Clinical conclusions
The effectiveness analysis showed that the outcomes were similar across the study groups, but there was a general (non significant) trend towards better results in the intervention group.

Measure of benefits used in the economic analysis
The health outcomes were left disaggregated and no summary benefit measure was used. A cost-consequences analysis was therefore conducted.

Direct costs
Discounting was not performed since the costs were incurred over a short period of time. The unit costs were not reported separately from the quantities of resources. The health service costs included in the analysis were for readmissions and ER visits for both the mothers and newborns. The cost/resource boundary adopted in the analysis was not stated. The resource use was estimated using actual data collected during the effectiveness study, while the costs...
were derived from the study hospital database. No price year was reported.

**Statistical analysis of costs**

Standard statistical analyses of the costs were performed to test the significance of differences in the total costs.

**Indirect Costs**

The indirect costs were not included in the analysis.

**Currency**

US dollars ($).

**Sensitivity analysis**

No sensitivity analyses were conducted.

**Estimated benefits used in the economic analysis**

See the 'Effectiveness Results' section.

**Cost results**

When summarising all the cost categories, the authors reported that, for mothers, there was a reduction of 0.56 days of birth length of stay (2.19 versus 1.63 days; p<0.0001) and a reduction of $953 total costs ($3,206 versus $2,253; p<0.0001), which favoured the intervention patients. For newborns, there was a reduction of 0.35 days of birth length of stay (2.01 versus 1.66 days; p=0.0006) and a reduction of $184 total costs ($1,742 versus $1,558; p=0.004), which also favoured the intervention patients.

**Synthesis of costs and benefits**

Not relevant as a cost-consequences analysis was conducted.

**Authors' conclusions**

The new Comprehensive Pregnancy Program (CPP) was as safe as standard care. It led to reduced costs, mainly due to the reduced hospital stay for both mothers and newborns.

**CRD COMMENTARY - Selection of comparators**

The rationale for the choice of the comparators was clear. The authors selected the care delivered before the introduction of the CPP, in order to assess the change occurring as a result of the programme itself. However, the authors did not report any detail of the characteristics of the standard care. You should decide whether it represents a valid comparator in your own setting.

**Validity of estimate of measure of effectiveness**

The analysis of effectiveness used a case-control study, which was appropriate for the study question. However, the retrospective design and the lack of randomisation may have limited the internal validity of the analysis. The study groups were not shown to be comparable at baseline and patient demographics were not reported. The authors acknowledged that the changes in both educational care protocol, and intrapartum and style of maternity care, could have represented potential confounding factors. The effectiveness results therefore need to be treated with caution.
Validity of estimate of measure of benefit
No summary benefit measure was used in the economic analysis. The analysis was therefore categorised as a cost-consequences study.

Validity of estimate of costs
The perspective adopted in the analysis was not reported. The economic analysis focused only on those costs having an impact on the length of stay. A detailed breakdown of the costs was not reported. The unit costs were not reported separately from the quantities of resources and no price year was given. These factors limit the reproducibility of the study in different settings. The cost estimates were specific to the study setting. The source of the cost data was reported. The cost results also need to be treated with caution.

Other issues
The authors did not compare their findings with those from other studies. They also did not address the issue of the generalisability of the study results to other settings. No sensitivity analyses were performed, thus the external validity of the analysis was low. The study referred to a sample of mothers and their newborns, and this was reflected in the conclusions of the analysis. The authors commented on some limitations of their analysis, which have been reported above.

Implications of the study
The authors highlighted that the CPP could represent a valid tool for cutting costs without reducing the effectiveness and safety of care. The CPP was considered as a useful template for the comprehensive view of the prenatal, intrapartum, and postpartum process.

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