Reducing maternal smoking and relapse: long-term evaluation of a pediatric intervention

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
Paediatric extended intervention designed to prevent or reduce smoking among women with new-born babies. The extended intervention delivered additional intervention at the first 4 well-baby visits (usually at 2 to 3 weeks, 2 months, 4 months and 6 months after birth) through brief advice and encouragement at each visit, accompanied by specially developed written materials and a video.

Type of intervention
Primary prevention.

Economic study type
Cost-effectiveness analysis.

Study population
Women who had smoked during the month before becoming pregnant. These were subdivided into smokers (currently smoking) and quitters (currently not smoking). Age, socio-economic status and occupation varied amongst the women.

Setting
Hospital. The economic study was performed at 49 paediatric practices in Oregon, USA

Dates to which data relate
Effectiveness data were taken from a study published in 1995. No dates were given for the costs.

Source of effectiveness data
Effectiveness data were derived from a single study (The Modification of Maternal Smoking (MOMS) Study).

Link between effectiveness and cost data
Costing appears to have been undertaken prospectively on the same patient sample as the effectiveness data.

Study sample
Paediatric practices were block-randomised to minimal (n=23) or extended (n=26) intervention. Blocking variables were location (Portland Metropolitan area versus other) and the number of practitioners. The mothers were the unit of analysis after adjusting for practice-level effects. Study enrolment occurred at the first visit to the paediatrician’s office (typically at 2 weeks postpartum), where mothers were asked by health questionnaire if they had smoked in the month prior to pregnancy. Of the 13,495 surveys completed in total (representing 76% of all mothers of new-borns), 3,204 reported smoking prior to pregnancy. However 2,901 forms were completed sufficiently to allow follow-up. Of the 158 paediatricians who were invited to participate by mail and telephone, 128 took part. Of the eventual 2,901 women
participating, 1,219 were allocated to the minimum intervention and 1,682 to the extended intervention.

**Study design**
The study was a multi-centre randomised controlled trial. 49 participating practices were block randomised. Follow-up was assessed at 6 months and 1 year by questionnaire with an incentive and if deemed necessary, a telephone call. 69% of mothers completed both the 6 month and 12 month questionnaires, and therefore form the basis of the analysis. The proportions of mothers in both groups who completed both follow-up assessments were similar. However those who completed follow-ups in both groups tended to be quitters at enrolment, older, have higher educational levels, were white, had more than one child and were less likely to have husbands who smoked. Mothers in the extended intervention group who completed the follow-ups were more likely to be older, better educated and less likely to have husbands who smoked than the minimal intervention group. These confounding variables were adjusted for.

**Analysis of effectiveness**
The analysis of effectiveness was based on treatment completers only. The primary health outcomes used in the study were smoking quit rates, likelihood of trying to quit smoking, cigarettes smoked per day and prevention of relapse among quitters. Secondary outcome variables included readiness to quit, and attitude toward, and knowledge of, ETS

**Effectiveness results**
Among mothers who quit smoking for pregnancy, those who received the extended intervention were significantly more likely to maintain their cessation throughout the 12 month follow up period (32.8% versus 26.1%). Similarly, among mothers who smoked at enrolment, those who received the extended intervention were more likely to quit after 6 months and stay quit throughout the 12 month assessment period (2.3% versus 1.2%). However, when a logistic regression was estimated, controlling for age, education and husband/partner's smoking status at enrolment, the analysis demonstrated no effect of the extended intervention on sustained quitting for either smokers (5.5% versus 4.7%) or quitters (42.9% versus 39.1%). In analyses of secondary outcomes, the main effect of practice was not significant and was thus not reported. Among those mothers who were smokers at enrolment and continued smoking during the twelve month period, those in the extended intervention group smoked significantly fewer cigarettes per day (p<0.01), had a greater readiness to quit (p<0.001), and had a more negative attitude towards smoking (p<0.01) and a greater awareness of the dangers of passive smoke exposure (p<0.001). Among mothers who had quit at enrolment but had subsequently relapsed, participants in the extended intervention group reported a significantly higher likelihood of trying to quit again(p<0.01).

**Clinical conclusions**
A paediatric office-based intervention can have a significant impact on maternal smoking, but the effect decreases with time. At 6 months, the significant effect of reduced parental smoking, and the 6 month and relapse prevention outcomes, may provide some benefit, but at 12 months, there is a small and marginally non-significant intervention effect on cessation.

**Modelling**
None.

**Measure of benefits used in the economic analysis**
As the 12 month follow-up revealed no significant treatment effect of the extended intervention, a full economic analysis was not performed as it was considered not justifiable by the authors. However, cost data were collected and reported.

**Direct costs**
Costs of such a programme include training time, time involved for staff assessment and advice/counselling, and
materials. No dates were provided, quantities and costs were not analysed separately and only health service costs were considered. No information was provided on the methods of data collection. Further specific details are obtainable from the authors.

**Statistical analysis of costs**
Not performed.

**Indirect Costs**
Not included.

**Currency**
US dollars ($).

**Sensitivity analysis**
Not performed.

**Estimated benefits used in the economic analysis**
At 6 months, the significant effect of reduced parental smoking, and the 6 month and relapse prevention outcomes, may provide some benefit, but at 12 months, there is a small and marginally non-significant intervention effect on cessation. A full economic analysis was not performed because of the absence of an effect on the primary outcomes.

**Cost results**
For a practice with up to 4 paediatricians and 6 office staff, it was estimated that the fixed costs of implementing the extended intervention should be under $500 (with up to $200 budgeted for an outside facilitator). Staff costs to determine and record the smoking status of each new mother entering the programme would be about $0.20-0.75 per mother. Intervention costs for quitters and smokers (consisting of professional time, staff time and written materials) would total $10 to $15 per mother over 4 visits, with up to $10 more for smoking mothers needing assistance with giving up.

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

**Authors’ conclusions**
The authors concluded that a paediatric office-based intervention can significantly affect smoking and relapse prevention for mothers of new-borns, but the effect decreases with time. Consistent prompting of the provider to give brief advice and materials at well-care visits could provide a low-cost intervention to reduce infant ETS exposure.

**CRD COMMENTARY - Selection of comparators**
A justification was given for the comparator used and the comparator chosen (minimal intervention) appears to represent usual practice. You, as a user of this database, should consider whether this is an appropriate comparator in your own setting.

**Validity of estimate of measure of benefit**
The study was based on a randomised trial which was well conducted, analysed and reported. Although no long-term effect in favour of the extended intervention was found, the fact that a short-term effect exists, and that there is a long-
term effect on the secondary outcomes, makes such a programme worth considering. Therefore in future study designs, it might be worth considering follow-up at shorter intervals e.g. 3 months.

**Validity of estimate of costs**
Although cost data were collected in the study, unfortunately insufficient detail of the source and nature of the costs was provided (at the discretion of the authors) due to the absence of a statistically significant effect in favour of the extended intervention. Further specific details are obtainable from the authors.

**Other issues**
The cost data may not be generalisable to other settings or countries. A full presentation of the cost data might still be useful in an attempt to assess the cost-effectiveness of such a programme in terms of the secondary effects which, according to this study, may be achievable in the long-term. The authors rightly acknowledged that a cost-effectiveness study was not performed (this was a cost-consequences study), but for the purposes of this database, this study is categorised under the broad classification of a cost-effectiveness analysis.

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