Community intervention to prevent child maltreatment in England: evaluating the contribution of the family nurse partnership

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ABSTRACT

Background The Government in England has recognized the importance of early intervention to promote positive child development and prevent maltreatment. In doing so, efforts have been made to increase the implementation of the Family Nurse Partnership (FNP) to target a greater number of families who require intensive secondary intervention.

Methods This paper presents an argument that the FNP can be targeted more effectively to yield a greater return on investment. This is based on the re-analysis of data collected by the largest cohort study carried out into risk factors for child maltreatment in England.

Results Currently, around 315 health visitors are estimated to be implementing this programme, projected to increase to around 585 health visitors in 2015. However, targeting the programme towards first-time, young vulnerable mothers with low socio-economic status means that around 1350 health visitors would be needed. Critically, targeting only this population is estimated to prevent only 10% of cases of child abuse and neglect.

Conclusions By targeting risk factors which are less common in the general population but which are more prevalent amongst abusive families, fewer specialist health visitors would be needed to prevent a higher percentage of child maltreatment.

Keywords children, cost-effectiveness, population-based and preventative services

Maximizing intervention to prevent child maltreatment in England

In the year ending 31 March 2012, there were 168 270 children registered as ‘children in need’ because of abuse or neglect in England.1 The Government in England has introduced a number of national policies to combat and prevent such violence to children. Amongst others, these include a national review on health visiting and families at risk, as well as revisions in primary health-care services to promote child health and welfare. The recent government document entitled ‘Early intervention: The next steps’,2 indicates a promising acknowledgement by the government that a proactive, as opposed to reactive, approach is crucial to the prevention of child abuse and neglect (CAN). Indeed, one of the key recommendations in this paper is the shift from ‘late reaction’ when combating social problems to focusing instead on ‘primary prevention’ strategies. This is highlighted with particular reference to the costs associated with placing children in care due to abuse and neglect.3 The report heavily promotes the use of the Nurse Family Partnership (NFP) in England on the basis that this intervention programme leads to a reduction in CAN and improves outcomes for children in vulnerable families.

Despite this commitment from the government, the current paper attempts to show how the implementation of the FNP in the UK does not appear to have been based on an adequate assessment of the most significant factors placing children at risk. Additionally, the suitability of the NFP to address risk factors associated with CAN appears to have
been overlooked. The authors demonstrate how targeting intervention of the FNP towards families with different risk factors than those currently used would require less health visitors to reach double the amount of abusive families, or an almost equal number of health visitors to reach three times the amount of abusive families. Hence, there is the potential to improve the cost-effectiveness of FNP and prevent more cases of CAN. The authors also highlight the incompatibility of the FNP with families where ‘moderate-to-high’ levels of domestic violence (DV) is present, and therefore argue the need for a more tailored approach to intervention.

**Targeting intervention towards risk**

Targeted services for ‘at-risk’ families can be achieved by identifying known ‘risk factors’ for child maltreatment in a family and then offering additional services before maltreatment occurs. However, it is important to note that the majority of families who have the presence of these ‘risk factors’ will not go on to maltreat their child. The largest prospective cohort study on risk factors for child maltreatment in an English population of 14,252 families was reported in 1997. Community nurses completed a 12-item screening checklist at the first home visit, 10 days after birth, for all newborns during a 12-month period in the Surrey area. They were then followed up over 5 years to explore the risk factors and incidence of CAN. This study demonstrated that a family with DV was 23 times more likely [relative risk (RR) = 23.4] to abuse their child under 5 years of age [positive predictive value (PPV) = 12.4], compared with a family with a child under five without that characteristic (see Table 1). Overall, health visitors using a checklist based on the risk factors outlined in Table 1 identified 7% of families in Surrey with a newborn child who showed a high number of predisposing factors (five or more) for child maltreatment. One in 13 of these high-risk families went on to abuse their children within the first 5 years of life in comparison with 1 in 400 low-risk families. The screening instrument at birth was sensitive to over two-thirds (68%) of child protection cases in the following 5 years, and correctly specified 94% of non-abusing families. The PPV of the whole screening instrument was 7.5%.

The importance of identifying interactions between risk factors should not be ignored when exploring their utility for the prediction of CAN. Therefore, discriminate function analysis was applied to the risk factor data from the Surrey cohort study to assess the relative contribution of each risk factor to predict CAN. Table 1 presents the risk factors (1 to 12) ranked in order of importance in terms of their ability to distinguish abusing from non-abusing families.

In 2006, a smaller cohort study of 4351 Essex families was reported. This study used similar risk factors, together with an assessment of poor parenting, and distinguished 27 families who were referred for child protection issues within the first year of life, with a 70% sensitivity and a 96% specificity (PPV = 11%). Again, DV was the most predictive characteristic (RR = 28.4).

Taking into account the presence of such risk factors and the characteristics of the family, targeted intervention can be offered to families in the form of positive parenting programmes.

**Implementation of the NFP in England**

The NFP was developed in the USA and is one of the most popular and well-researched home visitation parenting programmes (see Table 2). It is also cited as a prevention strategy to reduce CAN as well as promoting maternal and child health. Positive findings from the evaluative research carried out in the USA, in the absence of a universal health service, have led to the recent government decision to use the NFP (known as the FNP in the UK) as a targeted, secondary prevention service offered to ‘every vulnerable, first-time [low income] young mother who meets the criteria and wants to join’ (p. xix). As a result, the FNP in England will act as a support system to work alongside the universal Healthy Child Programme, as described above. One of the largest randomized-control trials as to the effectiveness of this programme is currently underway in England, with the findings expected later this year (2013). It should be noted that effect sizes from research based in the USA may not be replicated in an English setting, where universal health services exist.

It is claimed that 6000 families in England have been supported by the FNP, increasing to 7000 in 2011 and projected to almost double to 13,000 families in 2015. However, government figures suggest that 30,000 new families each year could benefit from the programme. Following NFP protocol, 9 health visitors are assigned to every 200 families in need. Based on the FNP being able to reach 7000 families in 2011, calculations suggest that this required 315 health visitors. To reach the projected 13,000 families in 2015, 585 health visitors are required. If all 30,000 families in need per year were to be reached by the FNP, this would require a total of 1350 health visitors, which is clearly a long way off current and projected targets. On the basis of these figures, the FNP is currently only able to reach around one-fifth of first-time, low-income mothers. Even with a projected investment in this area by 2015, more than half of the targeted families would still miss out, leaving a large amount of children vulnerable to maltreatment.

Questions can also be raised as to whether the FNP is hitting the right target. To explore this in more detail, the FNP inclusion criteria (first-time low-income mothers or
Table 1 The number of families and the relative risk of child abuse and neglect associated with family characteristics screened at birth\(^a\)

<table>
<thead>
<tr>
<th>Family characteristics at birth which are risk factors for CAN</th>
<th>Relative risk for abuse and neglect (\text{RR} )</th>
<th>PPV (%)</th>
<th>Abusing families ((n = 106)) (%)</th>
<th>Non-abusing families ((n = 14 146)) (%)</th>
<th>Families in total population presenting with the characteristic ((n = 14 252)) (%)</th>
<th>Representation in population</th>
<th>Number of health visitors needed to intervene nationally based on the presence of risk factor(^d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. History of spousal violence(^e)</td>
<td>23.4</td>
<td>12.4</td>
<td>32 (30.2)</td>
<td>226 (1.6)</td>
<td>258 (1.8)</td>
<td>1 in 55</td>
<td>586</td>
</tr>
<tr>
<td>2. Parent indifferent, intolerant or over-anxious towards child</td>
<td>13.2</td>
<td>7</td>
<td>33 (31.1)</td>
<td>438 (3.1)</td>
<td>471 (3.3)</td>
<td>1 in 30</td>
<td>1074</td>
</tr>
<tr>
<td>3. Single or separated parent</td>
<td>11.8</td>
<td>5</td>
<td>51 (48.1)</td>
<td>976 (6.9)</td>
<td>1027 (7.2)</td>
<td>1 in 14</td>
<td>2346</td>
</tr>
<tr>
<td>4. Socio-economic problems such as unemployment</td>
<td>15.7</td>
<td>3.9</td>
<td>75 (70.8)</td>
<td>1825 (12.9)</td>
<td>1900 (13.3)</td>
<td>1 in 8</td>
<td>4328</td>
</tr>
<tr>
<td>5. History of mental illness, drug or alcohol addiction</td>
<td>10.1</td>
<td>5.2</td>
<td>37 (34.9)</td>
<td>679 (4.8)</td>
<td>716 (5.0)</td>
<td>1 in 20</td>
<td>1627</td>
</tr>
<tr>
<td>6. Parent abused or neglected as a child</td>
<td>12.5</td>
<td>7.6</td>
<td>21 (19.8)</td>
<td>255 (1.8)</td>
<td>276 (1.9)</td>
<td>1 in 52</td>
<td>618</td>
</tr>
<tr>
<td>7. Infant premature, low birth rate</td>
<td>3.6</td>
<td>2.3</td>
<td>23 (21.7)</td>
<td>976 (6.9)</td>
<td>999 (7.0)</td>
<td>1 in 14</td>
<td>2278</td>
</tr>
<tr>
<td>8. Infant separated from mother for more than 24 h post-delivery</td>
<td>4.2</td>
<td>2.8</td>
<td>13 (12.3)</td>
<td>453 (3.2)</td>
<td>466 (3.3)</td>
<td>1 in 31</td>
<td>1074</td>
</tr>
<tr>
<td>9. Mother &lt;21 years old at the time of birth</td>
<td>4.9</td>
<td>2.8</td>
<td>31 (29.2)</td>
<td>1089 (7.7)</td>
<td>1120 (7.9)</td>
<td>1 in 13</td>
<td>2571</td>
</tr>
<tr>
<td>10. Step-parent cohabite present</td>
<td>5.5</td>
<td>3.2</td>
<td>29 (27.4)</td>
<td>877 (6.2)</td>
<td>906 (6.4)</td>
<td>1 in 16</td>
<td>2083</td>
</tr>
<tr>
<td>11. Less than 18 months between birth of children</td>
<td>2.3</td>
<td>1.6</td>
<td>17 (16.0)</td>
<td>1061 (7.5)</td>
<td>1078 (7.6)</td>
<td>1 in 13</td>
<td>2473</td>
</tr>
<tr>
<td>12. Infant mentally or physically handicapped</td>
<td>2.6</td>
<td>1.9</td>
<td>3 (2.8)</td>
<td>156 (1.1)</td>
<td>159 (1.1)</td>
<td>1 in 90</td>
<td>358</td>
</tr>
<tr>
<td>13. Young mother (&lt;21 years) with socio-economic problems</td>
<td>6.5</td>
<td>3.8</td>
<td>24 (23)</td>
<td>593 (4.2)</td>
<td>617 (4.3)</td>
<td>1 in 23</td>
<td>1399</td>
</tr>
<tr>
<td>14. First-time young mother (&lt;21 years) with socio-economic problems</td>
<td>0.3</td>
<td>2.4</td>
<td>11 (10)</td>
<td>444 (3.1)</td>
<td>455 (3.2)</td>
<td>1 in 31</td>
<td>1041</td>
</tr>
</tbody>
</table>

\(^a\)As determined from a 5-year prospective cohort study of 14 252 English families, from which 106 families were involved in child protection procedures by the time the child reached the age of 5 years. The risk factors (1 to 12) are ranked in order of importance as to their relative predictive value for predicting CAN as determined by discriminate function analysis (adapted from ref. 5).

\(^b\)Sensitivity = true positive rate.

\(^c\)1 specificity = false positive rate.

\(^d\)Based on the NFP health visitor to client ratio (nine health visitors to 200 families) and the 2010 population of live births in England and Wales \((n = 723 165)\) [13].

\(^e\)FNPN has not been shown to be effective in families where DV is present.

\(^f\)Risk factors used for targeting first-time mothers in the NFP programme.
The NFP is a home visitation programme led by specially trained public health nurses, designed to provide support to first-time, low-income mothers and their infants from pregnancy until the child reaches 2 years of age. The provision of the service is based on the principle that each health nurse has no more than 25 families as part of their case load at any one time, and that each supervisor has no more than eight nurses working under their supervision (suggesting a ratio of 200 families per 9 health visitors). Working under these principles, the programme aims to improve pregnancy outcomes, improve parental responsibility and care, and in turn, improve attachment and the health and well-being of the infant and the economic self-sufficiency of the family. Extensive research has been carried out on the NFP in America, including many high-quality randomized control trials. One such study was conducted over a 15-year period and found that on follow-up, a number of significant differences were found between those families who were visited and those families with newborns who were not. In summary, the visited families showed the following differences:

- Mothers
  - Less family aid received
  - 79% reduction in CAN
  - 44% reduction in maternal alcohol/drug difficulties
  - 69% fewer arrests of mothers

- Teenagers
  - 54% fewer arrests of 15 year olds
  - 58% fewer sexual partners
  - 51% fewer days consuming alcohol
  - 28% fewer cigarettes smoked

These findings support the NFP as an effective prevention strategy for the promotion of child health and welfare. An evaluation of the NFP in the USA has also demonstrated savings over five times greater than the cost of the programme. The findings from a large UK-based evaluation are expected in 2013.

Impact of DV

Families with a history of DV are said to face the highest relative risk (RR) for child maltreatment (e.g. RR = 23.4 according to the Surrey cohort data and RR = 28.4 according to the Essex cohort data) and targeting this risk factor could lead to the identification and prevention of around 30% CAN cases (according to the Surrey cohort data). However, David Olds notes that ‘moderate-to-high’ levels of DV ( >28 incidents of DV over a 15 year period) significantly reduce the ability of the NFP programme to prevent CAN. Figures from the 2008/2009 British Crime Survey (BCS) indicate that within 1 year, only 23% of UK victims reported just one incidence of DV, with 32% reporting two or more, 18% reporting they ‘don’t know how many times’ and 27% choosing not to answer the question. Similar figures were reported in the 2007/2008 BCS. Based on these statistics, it would appear that 28 DV incidents in 15 years (averaging less than two incidents a year) is more likely to be considered a low level of DV for UK victims, not moderate to high. It is therefore likely that the FNP would be ineffective in preventing CAN for the majority of DV victims in England and therefore alternative intervention programmes should be considered in these cases. Despite this, the early intervention document outlined by the government focuses solely on the NFP. It therefore fails to acknowledge that without intervention tailored to the needs of the child nearly a third of the most vulnerable children living with DV will be excluded from receiving targeted secondary intervention.

The ‘Triple P’ Positive Parenting Programme offers a multilevel family support strategy aimed at the prevention of those who are first-time mothers would mean that the vast majority (90%) of abusive mothers and families would be excluded from the programme. These findings create a strong argument to suggest the FNP is being targeted ineffectively.

A recent Department of Health report on the initial implementation of the FNP shows that on intake, vulnerability factors are recorded for the first-time mothers selected into the programme. These factors are single parent; not living with mother; low income; smoking; history of abuse; homeless; no GCSEs and receiving mental health services. However, the way these vulnerability factors are used is unclear as they were recorded on intake into the programme and not for selection on to the programme. In addition, the number of risk factors present had no significant effect on the level of intervention (i.e. number of visits) from health visitors. Indeed, 14% of mothers accepted onto FNP had none of these vulnerability factors and 70% had less than three. The overall attrition rate of mothers on the FNP was 41%.
severe behavioural, emotional and developmental problems in children (aged 0–12 years). This is by enhancing the knowledge, skills and confidence of parents. Evaluation of this programme has shown how it can prevent family breakdown and violence by family members. It has also been shown to be cost-effective in preventing CAN, with a recent RCT in America reporting large effect sizes for the reduction of child maltreatment and out of family care placements. The potential of this programme to prevent CAN in English families where DV is present should therefore be explored.

**Targeting intervention more effectively**

Interventions are more cost-effective when families are targeted based on less common risk factors within the general population (e.g. DV, parent abused or neglected as a child or parenting is intolerant, indifferent or over-anxious). This is because the interventions concern a smaller proportion of the population yet occur in a larger number of child maltreatment cases, thus producing a greater prevention yield (i.e. high PPV). By drawing upon the Surrey cohort data, it was possible for us to estimate how prevalent certain risk factors were within abusive families and the general population. We then calculated PPVs to indicate how useful these variables may be as predictive factors to be targeted through intervention (see Table 1). This was done by dividing the number of ‘true positive’ hits by the number of total hits in the population (‘true positive hits’ plus ‘false positive’ hits), multiplied by 100 (TP/(TP + FP) × 100). The resulting figure expresses the percentage of true positive hits that could be expected when applying a particular risk factor to intervention, i.e. the PPV. Combining this with figures on the national birth rate, estimation as to how many health visitors would be needed to implement a modified FNP using alternative risk factors to the ones outlined by the government can be calculated, together with the impact this may have on prevention.

Data from the Surrey cohort study indicated that 3% of all parents were said to be indifferent, intolerant or over-anxious towards their child, yet this factor was present in almost one-third (31%) of abusive families (PPV = 7.0%). Likewise, 2% of parents reported they had been abused or neglected as a child in the general population, yet one in five (20%) abusive parents reported this characteristic (PPV = 7.6%). This compares to young, first-time mothers with economic problems, who were present in 30% of the population but just 10% of abusive families (PPV = 2.4%). These figures suggest that by targeting the smaller number of families where the parent was abused or neglected as a child, or parents who were indifferent, intolerant or over-anxious towards their child, CAN could be reduced by up to a third rather than just 10% (see Table 1).

With 723,165 live births in 2010 in England and Wales, it can be calculated that a total of 618 and 1074 health visitors (respectively), would be needed to target families with these risk factors (see Table 1). On the other hand, targeting all of the young, first-time mothers with economic problems within the Surrey cohort would require 1041 health visitors. These figures clearly illustrate the potential to improve the cost-effectiveness of FNP whilst preventing more cases of CAN.

**Discussion**

**Main findings of this study**

It is recognized that FNP has the potential to be effective in promoting the positive development of children and protecting them from abuse and neglect. However, this article has shown that currently, the FNP is only reaching around one-quarter of the families it is said to have the potential for benefiting. By targeting intervention towards young, first-time mothers with economic problems (current English inclusion criteria), it is estimated that around 90% of cases of CAN would be missed (approximation based on findings from a large Surrey cohort study).

The relatively low prevalence of child maltreatment in the population as a whole implies that targeting this group based on the presence of risk factors would yield large numbers of false positives, even with the most optimistic estimates of sensitivity and specificity. Hence, the PPV of any one characteristic would be relatively low compared with using a combination of risk factors. Nevertheless, it is proposed that targeting risk factors with a lower prevalence in the general population but with a higher prevalence amongst abusive families would be a more effective way of preventing abuse and neglect. Even small differences in relatively low-positive predictive accuracy (PPV, 7% as opposed to 2%) can have a substantial effect on cost and the number of false positives. Ideally, risk factors should also have a reasonable sensitivity to reduce the number of false negatives. Risk factors, such as ‘parents abused or neglected as a child’ with a PPV of 7.6% and a sensitivity of 19.8%, and ‘parent indifferent, intolerant or over-anxious towards the child’ with a PPV of 7.0% and a sensitivity of 31%, would be more cost-effective for targeting programme interventions. This is in contrast to targeting ‘first-time young mothers with socio-economic problems’ with a PPV of 2.4% and a sensitivity of 10.3% (using the Surrey cohort data).

**What is already known on this topic**

In 2011, it was reported that the FNP programme is recording up to eight vulnerability factors for first-time mothers at intake. However, there is no evidence that this information is being utilized effectively to prevent CAN in terms of initial screening or support. As the 14% of first-time mothers without vulnerability factors are those least likely to drop
out, in future it will be of interest to determine if those families with specific vulnerability patterns are among 41% who leave the FNP programme.

**What this study adds**

Using more cost-effective risk factors for targeting the FNP programme would allow the programme to be more accessible to a greater number of families in need, and hence would help protect a greater number of children from being maltreated. It is vital that families with a history of DV are not ignored by health professionals as it regularly presents the highest relative risk for child maltreatment. It is also cited in 46% CAN referrals to police child protection units. As the Government in England has prioritized the FNP over other parenting programmes, this means that the most predictive risk factor is not applicable to be targeted. Therefore, alternative interventions which are effective in domestically violent families should be explored. Initial assessment of need in children and families for child care and protection, as determined by the presence or absence of a combination of risk factors (see Table 1), can be carried out by health visitors as part of a universal health visiting service (as is currently in place using the Healthy Child Programme).

**Limitations of this study**

The main findings are based on data collected as part of the largest cohort study into risk factors for CAN in England which was published in 1997. Therefore, the accuracy of the findings regarding the current risk factors for CAN can provide only an estimate and may be out-dated. Unfortunately, there has been no subsequent cohort study of this scale conducted in England. Therefore, a current cohort study looking at risk factors for CAN is necessary to confirm the above observations.

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**References**