Research Report

Attitudes and adjustment to the parental role in mothers following treatment for postnatal depression

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A B S T R A C T

Background: Few intervention studies of postnatal depression (PND) have evaluated accompanying changes in parenting, in spite of mounting evidence that exposure to chronic depression is detrimental to infant development. This study examined maternal attitudes and adjustment over the first postnatal year within a treatment trial. The aim was to examine whether maternal adjustment improved with earlier remission, and with combined medical and psychological treatment.

Methods: As part of a multicentre pragmatic randomised controlled trial of treatment for PND, mothers completed a measure of maternal adjustment and attitudes and the Edinburgh Postnatal Depression Scale at an initial home visit (week 0) and three follow-ups (weeks 4, 18 and 44).

Results: Maternal attitudes and adjustment improved with PND remission; earlier remission conferred no additional benefit by 44-week follow-up. In line with previous studies, no particular treatment modality (antidepressant or health-visitor delivered non-directive counselling), or combination of treatments, was more effective for improving adjustment to parenthood. However, the earlier start of antidepressant treatment provided a short-term advantage for improving attitudes and reducing perceived stress.

Limitations: As a result of the study's pragmatic trial design, there was high treatment non-compliance and no 'pure' control group. More depressed mothers may have been less likely to complete the maternal adjustment and attitudes measure.

Conclusions: Effective treatment of PND is important not only for the mother's wellbeing but also for healthy adjustment to parenthood. Provision of treatment choice and early antidepressant treatment are suggested for optimising maternal attitudes and adjustment.

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1. Introduction

At no other time is someone so dependent on a caregiver to meet their needs as in early infancy — for stimulation, emotion regulation and optimisation of learning. However, approximately 13% of newly delivered mothers will experience postnatal depression (PND; Gaynes et al., 2005). There is ample evidence that affected mothers are more likely to have bonding difficulties (Brockington et al., 2001), increased parenting-related stress and anxiety (Milgrom and McCloud, 1996), low parenting efficacy (Teti and Gelfand, 1991), different interpretations of infant behaviour from objective measures (Foreman and Henshaw, 2002), and more negative interactions with their infant (Cornish et al., 2006; Nagata et al., 2003; Righetti-Veltema et al., 2002; Rogosch et al., 2004). These difficulties are reflected in the negative attitudes of mothers with PND toward their children and adjustment
to parenthood (Bernazzani et al., 2005; Webster et al., 1994). Several prospective studies suggest that exposure to maternal depression in the first year of a child’s life is particularly detrimental to their developmental progress (Essex et al., 2001; Fihrer et al., 2009; Halligan et al., 2007; Hay et al., 2001, 2008; Murray, 1992; Murray et al., 1999). Treatment aims to emphasise the need for early detection and intervention (NICE Guidelines, 2007), one rationale being to prevent infant problems.

Despite the relative ease with which maternal adjustment and maternal attitudes can be measured, very few PND intervention studies have evaluated changes related to parenting. They have typically involved small samples and have produced inconsistent results. Warner et al. (1997) reported that in a postnatally depressed sample (N = 80), negative cognitions related to motherhood were highly associated with depressive symptoms, although cluster analysis revealed a depressed subgroup (n = 35) without such maladaptive attitudes. Among those who received treatment (N = 41), negative cognitions decreased after three months, concordant with symptom reduction and irrespective of treatment type (drug/placebo or 1–6 counselling sessions). By contrast, in another sample (N = 44), Fleming et al. (1992) reported that depressed mothers who attended a support group described no differences in feelings about parenthood compared with a depressed control group, following intervention. However, the intervention did not alleviate maternal depression either.

Other studies suggest that mothers with PND adjust to the parenting role as mood is enhanced, irrespective of treatment modality. Murray et al.’s (2003) randomised trial of counselling (N = 40), psychotherapy (N = 40) and behavioural interaction guidance (N = 41) demonstrated a reduction in parent-reported infant relationship problems as well as an improvement in maternal mood in all treatment arms. However, post-treatment relational difficulty was measured only at four months, relatively early in the postpartum period; and parenting attitudes may not necessarily be enhanced when infant relationship problems diminish. Indeed, such change did not translate to more sensitive maternal behaviour in later observational assessments. The only other PND trial to evaluate a parent-related variable (Misri et al., 2006) reported that parenting stress was alleviated by antidepressant treatment alone (N = 16) or when combined with CBT (N = 19); mothers who remitted reported lower post-treatment parenting stress than those who did not. Moreover, at post-treatment, most of the stress that mothers reported was related to the parenting role rather than viewed as caused by the infant, which may be more adaptive.

It remains unclear whether maternal adjustment to parenting in the context of PND is improved by the effective treatment of maternal mood and, if so, which treatment is most effective at producing positive attitudinal change. We attempted to address these questions within a large community sample of mothers with moderately severe PND. The RESPOND (Randomised Evaluation of antidepressants and Support for women with P0stNatal Depression) trial compared the effectiveness of two of the most widely used treatments for moderately severe PND, antidepressants and a community-based psychosocial intervention (listening visits), in a multicentre, pragmatic randomised controlled trial. We examined maternal adjustment to becoming a parent and attitudes to parenthood at four time points during the first postnatal year. The aims were: (1) to examine the effect of treatment remission from PND, and the timing of remission, on maternal adjustment to parenting and maternal attitudes at final follow-up when the infant was one year; and (2) to compare the relative effectiveness of the two treatments.

2. Methods

2.1. Sample and randomisation

The recruitment procedure is described in full in Sharp et al. (2010). Eligible women were aged 18 years and over who had recently delivered and were living with their new baby aged <27 weeks old. Women were recruited between January 2005 and August 2007 from 77 GP practices across three UK centres (Bristol, Manchester and London) providing a wide range of demographic backgrounds. Women with a diagnosis of alcohol or drug abuse, psychosis or those already receiving treatment for depression were excluded. Practices sent out 10,666 invitations to eligible women and received 4173 (39%) non-duplicate responses with a completed Edinburgh Postnatal Depression Scale (EPDS). Those who scored 11+ (N = 989; 23%) were offered a ‘baseline assessment’ home visit for trial eligibility. A diagnosis of PND was confirmed if women scored 13+ on a further EPDS, and had a diagnosis of depression as assessed by a computerised version of the Clinical Interview Schedule – Revised (CIS-R; Lewis, 1994). The home visit was usually conducted at about 8 weeks postpartum (2 weeks after initial EPDS screening), although women could receive this visit up to 26 weeks postpartum. At baseline (week 0), infants had a mean age of 11.54 weeks (SD: 4.50; range: 3.29–26.57 weeks). Of the 622 home visits conducted, 298 women scored <13 on the EPDS and 54 scored >13 but did not have a CIS-R diagnosis, so were ineligible, as was 1 woman whose baby was >26 weeks old. Of the 269 eligible women, 7 were excluded by their GP/HV and 8 declined randomisation. A total of 254 eligible women were randomised and allocated to either antidepressants (N=129) or listening visits (N=125). Socio-demographic data from a self-report questionnaire showed some differences between the two randomised groups in terms of diagnosis, number of children, breastfeeding and employment status (Sharp et al., 2010).

2.2. Interventions

Women randomised to antidepressants (ADs) were asked to see their GP who prescribed according to a clinical practice guideline based on the North of England Guidelines (Eccles et al., 1999) and the British Association for Psychopharmacology 2000 Guidelines (Anderson et al., 2000). An SSRI was recommended as first line treatment (fluoxetine if not breastfeeding, sertraline, paroxetine, citalopram or escitalopram), but a pragmatic approach was employed whereby the GP and the patient agreed which medication would be prescribed. The woman’s GP and practice health visitor (PHV) were informed of the AD group allocation and asked not to start any form of psychological intervention aimed at alleviating the
probable depression was a score of ≥12 following previous remission) were removed (N=25; 9.8%). Similar to the non-relapsed group, MAMA scores in the overall relapsed group improved at the first three time points, but worsened at 44 weeks (relapse data available at week 0), we assumed ‘no remission’ in missing EPDS data points that precede the first recorded point of remission (if at all) and continued remission in any subsequent missing data points.

2.5. Data cleaning prior to main analyses

Prior to testing whether earlier remission (the time point at which an EPDS score of <13 was obtained) led to better maternal attitudes at 44 weeks, relapse cases (i.e. EPDS scores ≥12 following previous remission) were removed (N=25; 9.8%). Similar to the non-relapsed group, MAMA scores in the overall relapsed group improved at the first three time points, but worsened at 44 weeks (relapse data available at week 0), we assumed ‘no remission’ in missing EPDS data points that precede the first recorded point of remission (if at all) and continued remission in any subsequent missing data points.

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Non-compliant cases (defined as having received <4 LVs and/or reported (through questionnaire response or from GP notes) at least ‘sometimes missed 1 dose’ of AD up to the time point of interest) were removed before repeated-measures ANOVA compared treatment effects on the MAMA. N=85
(33.5%) were ‘non-compliant’ at some point (the design allowed women to switch treatment arm part way through and thus not complete a full course of the randomised treatment). Non-compliant women did not differ significantly from their compliant counterparts on EPDS score at any point. Separate analyses were conducted first for each time point of comparison as a result of the staged study design and to minimise sample size loss (due to higher rates of MAMA non-completion at later time points). MAMA scores were normally distributed at all time points.

2.5.3. Treatment group comparisons

At 0–4 weeks, the AD group was compared with GSC (i.e. the ‘LV group’ pre-treatment); at 0–18 weeks and 18–44 weeks, the four treatment groups were compared (AD only, AD→LV, LV only, and LV→AD). All analyses controlled for baseline (week 0) MAMA, the point of randomisation (subsequent treatment groups were to some extent self-selected because of the pragmatic cross-over design). Infant age (at latest measurement) was also adjusted for, because of its correlation with early total MAMA (week 0: Pearson r = 0.19; p = 0.003; week 4: r = 0.21; p = 0.003) and a between-group (3–8 weeks (N = 24), 8–14 weeks (N = 68), 14+ weeks (N = 18)) trend of infant age (repeated-measures ANOVA controlling for treatment arm: F[2, 106]=2.38; p = 0.1). Specifically, mothers of infants 14+ weeks at baseline had slightly higher MAMA scores throughout. No other main demographic effects emerged: socioeconomic status (professional-intermediate, semi-routine/routine; F[1, 77]=0.01); low wage (£1000, £1000+ per month; F[1, 71]=0.41); employment status (F[1, 106]=2.06); qualifications (none/GCSE, further; F[1, 102]=0.74); region/centre (Bristol, Manchester, London; F[2, 106]=0.62); ethnicity (Caucasian, other; F[1, 107]=1.64); cohabitation status (F[1, 107]=0.21); marital status (married, unmarried; F[1, 101]=0.01); primiparity (F[1, 107]=0.04); or breastfeeding (F[1, 107]=0.17). Some factors interacted with time: mothers educated up to GCSE (F[3, 306]=3.16; p = 0.03) and those with a low income

![Fig. 1. MAMA total completion rates throughout intervention and follow-up.](image-url)
started with better maternal attitudes that worsened by 44 weeks. Married women \( F[3, 303] = 2.93; p = 0.03 \) and women living with a partner \( F[3, 321] = 3.27; p = 0.02 \) showed more improvement in their MAMA score.

### 2.5.4. MAMA subscales and repeated measures analysis

To identify whether particular kinds of parent-related attitude were more amenable to change, repeated-measures ANOVA were conducted on MAMA subscales (maternal feelings, parent stress, and parenting anxiety), after removing missing data within the given subscale and controlling for baseline subscale scores. The subscales were derived from exploratory factor analyses (using principal component analysis with eigenvalues \( \geq 1 \) and Promax rotation method) from which a ‘best fit’ across all time points was identified (Table 1). In the parenting anxiety subscale, item 7 (the appeal of having several children) was reverse-scored because of its consistent negative loading relative to other item loadings in the third factor. The original scoring was retained for the total MAMA in line with previous validation work (Kumar et al., 1984).

We also compared groups across all time points using repeated-measures ANOVA — with a smaller sample because of missing data and non-compliance. Remission (most recent EPDS score \(< 13\) ) was added as an independent variable to each total MAMA×treatment analysis to test whether the effect of remission was stronger than that of treatment group/allocation.

### 3. Results

#### 3.1. Does PND remission and, in particular, earlier remission lead to better maternal attitudes?

Overall maternal adjustment and attitudes to parenthood improved with time (or treatment); mean total MAMA at 0, 4, 18 and 44 weeks respectively were 32.58 (SD: 5.36), 34.45 (SD: 5.81), 36.49 (SD: 5.00) and 37.47 (SD: 5.13). When EPDS scores were correlated with MAMA scores, weak associations emerged at baseline — likely to be an artefact of the narrow EPDS score range (which were necessarily above clinical threshold for eligibility) — but which increasingly strengthened with time (Table 2). A cluster analysis of the distribution of EPDS and MAMA scores at 44 weeks identified 2 groups: a ‘persistent depression/low adjustment’ group (\( N = 47 \); mean EPDS = 17; MAMA = 32.06), and a ‘remitted/high adjustment’ group (\( N = 101 \); mean EPDS = 8; MAMA = 39.99).

Early remission from PND (at 4 weeks) conferred no extra benefit to 44-week maternal attitudes over remission at 18 or 44 weeks (Fig. 2). Although there were significant between-group effects of remission time on total MAMA score \( F[3, 122] = 13.53; p < 0.001 \) and MAMA subscales (maternal feelings: \( F[3, 125] = 6.96; p < 0.001 \); parent stress: \( F[3, 124] = 6.00; p = 0.001 \); parenting anxiety: \( F[3, 123] = 7.02; p < 0.001 \)), Bonferroni post-hoc tests revealed that the differences were accounted for by the suboptimal maternal attitudes of the ‘no remission’ group compared with all other groups (\( p < 0.01 \)). Thus, although maternal adjustment improved with remission from PND, earlier remission conferred no additional benefit at final (44-week) follow-up.

#### 3.2. Comparing maternal attitudes across treatment arms at each follow-up

##### 3.2.1. 0–4 weeks: AD and GSC

Maternal attitudes improved with time \( F[1, 163] = 25.47; p < 0.001 \), particularly in the AD group, although the interaction effect did not reach statistical significance \( F[1, 163] = 3.25; p = 0.07 \) (Fig. 3a). At MAMA subscale level, maternal feelings improved over time in both groups \( F[1, 171] = 24.62; p < 0.001 \) with ADs conferring a significant advantage (time×treatment allocation: \( F[1, 171] = 4.22; p = 0.04 \)). ADs also

### Table 1

Pattern matrix of rotated factors of MAMA at each time point.

<table>
<thead>
<tr>
<th>Factor</th>
<th>Week 0</th>
<th>Week 4</th>
<th>Week 18</th>
<th>Week 44</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Subscale 1: maternal feelings</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Regretted having</td>
<td>.67</td>
<td>.86</td>
<td>.60</td>
<td>.72</td>
</tr>
<tr>
<td>5. Proud mother</td>
<td>.71</td>
<td>.76</td>
<td>.75</td>
<td>.92</td>
</tr>
<tr>
<td>6. Happy have baby</td>
<td>.84</td>
<td>.76</td>
<td>.86</td>
<td>.84</td>
</tr>
<tr>
<td>8. Disappointed by</td>
<td>.61</td>
<td>.53</td>
<td>.55</td>
<td>.68</td>
</tr>
<tr>
<td>9. Enjoyed caring</td>
<td>.74</td>
<td>.71</td>
<td>.91</td>
<td>.68</td>
</tr>
<tr>
<td>12. Enjoyed feeding</td>
<td>.79</td>
<td>.67</td>
<td>.88</td>
<td>.77</td>
</tr>
<tr>
<td>Subscale 2: parent stress</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Enough time</td>
<td>.87</td>
<td>.78</td>
<td>.64</td>
<td>.82</td>
</tr>
<tr>
<td>11. Life difficult</td>
<td>.61</td>
<td>.55</td>
<td>.77</td>
<td>.88</td>
</tr>
<tr>
<td>Subscale 3: parenting anxiety</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Worry good</td>
<td>.66</td>
<td>.62</td>
<td>.50</td>
<td>.41</td>
</tr>
<tr>
<td>2. Worried hurt baby</td>
<td>.51</td>
<td>.74</td>
<td>.48</td>
<td>.92</td>
</tr>
<tr>
<td>7. Several children</td>
<td>.53</td>
<td>.45</td>
<td>.75</td>
<td>.74</td>
</tr>
<tr>
<td>10. Healthy normal</td>
<td>.73</td>
<td>.67</td>
<td>.85</td>
<td>.69</td>
</tr>
<tr>
<td>% of variance</td>
<td>33.62</td>
<td>8.63</td>
<td>11.75</td>
<td>38.39</td>
</tr>
</tbody>
</table>

\( \* \) Only factor loadings of above \( .40 \) were considered in determining the overall MAMA subscale.
improved parenting stress ($F[1, 177]=5.67; p=0.02$), but not parenting anxiety ($F[1, 171]=0.01; p>0.05$). When remission was adjusted for in the total MAMA analysis, the trend in treatment allocation disappeared ($F[1, 161]=0.48; p>0.49$). Although the effect of remission was highly significant ($F[1, 161]=15.37; p<0.001$), there was no time×treatment×remission interaction ($F[1, 161]=0.25$).

3.2.2. 4–18 weeks: AD only, AD→LV, LV only, and LV→AD

Effects of treatment arm ($F[3, 102]=2.63; p=0.05$) and time ($F[1, 102]=26.13; p<0.001$) emerged, but did not interact ($F[3, 102]=0.95$). All treatment groups showed improvement, with the AD only group producing consistently higher MAMA total scores even when controlling for baseline MAMA (Fig. 3b). Subscale analyses showed that parenting stress particularly decreased with time ($F[1, 117]=6.20; p=0.01$) as did parent

### Table 2
Pearson correlations: MAMA scores and depressed mood.

<table>
<thead>
<tr>
<th>Week</th>
<th>Total attitudes</th>
<th>Maternal feelings</th>
<th>Parent stress</th>
<th>Parenting anxiety</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS-R</td>
<td>$r$</td>
<td>$-0.14^*$</td>
<td>$-0.09$</td>
<td>$-0.11$</td>
</tr>
<tr>
<td>0</td>
<td>$N$</td>
<td>240</td>
<td>246</td>
<td>252</td>
</tr>
<tr>
<td>EPDS:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>$r$</td>
<td>$-0.08$</td>
<td>$-0.06$</td>
<td>$0.02$</td>
</tr>
<tr>
<td>$N$</td>
<td>240</td>
<td>246</td>
<td>252</td>
<td>248</td>
</tr>
<tr>
<td>4</td>
<td>$r$</td>
<td>$-0.34^{**}$</td>
<td>$-0.28^{**}$</td>
<td>$-0.31^{**}$</td>
</tr>
<tr>
<td>$N$</td>
<td>203</td>
<td>207</td>
<td>210</td>
<td>206</td>
</tr>
<tr>
<td>18</td>
<td>$r$</td>
<td>$-0.46^{**}$</td>
<td>$-0.33^{**}$</td>
<td>$-0.36^{**}$</td>
</tr>
<tr>
<td>$N$</td>
<td>193</td>
<td>198</td>
<td>199</td>
<td>194</td>
</tr>
<tr>
<td>44</td>
<td>$r$</td>
<td>$-0.63^{**}$</td>
<td>$-0.45^{**}$</td>
<td>$-0.51^{**}$</td>
</tr>
<tr>
<td>$N$</td>
<td>148</td>
<td>152</td>
<td>151</td>
<td>149</td>
</tr>
</tbody>
</table>

* $p<0.05$.
** $p<0.005$.

Fig. 2. Maternal attitudes at 44 weeks according to time point of remission.

Fig. 3. Maternal attitude change (a) between 0 and 4 weeks: AD and GSC; (b) between 4 and 18 weeks by treatment arm; and (c) between 0 and 44 weeks by treatment arm.
anxiety to a lesser extent ($F[1, 110] = 3.66; p = 0.06$), although in the latter with little change in the AD only group. By contrast, maternal feelings became more negative ($F[1, 109] = 17.05; p < 0.001$), irrespective of treatment arm (treatment: $F[3, 109] = 2.00$; interaction: $F[3, 109] = 0.21$). When remission was added as an independent variable to the total MAMA analysis, the treatment effect disappeared ($F[1, 98] = 1.29; p > 0.05$); the effect of remission was highly significant ($F[1, 98] = 6.57; p = 0.01$). There was an interaction trend of time $\times$ treatment $\times$ remission ($F[3, 98] = 0.08$). While all remitted groups improved in MAMA total scores, among those still depressed, the AD only group scores worsened and those who had switched to LVs showed a larger degree of improvement.

3.2.3. 18–44 weeks: AD only, AD $\rightarrow$ LV, LV only, and LV $\rightarrow$ AD

Overall, no significant effects were found (treatment arm: $F[3, 74] = 0.85$; time $F[1, 74] = 0.72$; time $\times$ treatment: $F[3, 74] = 0.05$) (Fig. 3c). A trend effect emerged of treatment on parenting anxiety specifically, as the AD $\rightarrow$ LV group became slightly more anxious ($F[3, 80] = 2.38; p = 0.08$). The addition of remission as an independent variable in the total MAMA analysis was also non-significant ($F[1, 70] = 0.51$), although there was a time $\times$ remission interaction ($F[1, 70] = 10.40; p = 0.002$). Those who remitted had increasing MAMA scores whereas the scores of those who were still unwell tended to remain stable or decrease slightly, suggesting a protective effect of remission on maternal adjustment.

3.3. Comparing treatments across all time points

No significant effect of treatment arm ($F[3, 66] = 0.85$) or time $\times$ treatment arm interaction ($F[9, 198] = 0.95$) was found; all treatment groups improved with time ($F[3, 198] = 14.09; p < 0.001$) (Fig. 4). The addition of remission (i.e. EPDS score $< 13$ at week 44) as an independent variable was non-significant ($F[1, 70] = 0.51$), but there was a time $\times$ remission interaction ($F[3, 186] = 4.98; p = 0.002$). Those who remitted by 44 weeks showed steady improving MAMA scores while those still depressed at 44 weeks showed initial increases followed by decreases at 18–44 weeks, irrespective of the treatment arm.

![Fig. 4. Maternal attitude change between 0 and 44 weeks by treatment arm.](image-url)
(since the later LV only group were those who did not wish to move to or add in ADs).

The mothers in our study tended to adjust positively to their infant with time and/or treatment for depression in the first few months postnatally. These improvements, along with the changes observed in maternal adjustment subscale factor loadings across time, suggest a need in studies to measure postnatal maternal adjustment at multiple time points. However, the attitudes and adjustment of some mothers are more likely to alter than others: women with a partner are more likely to show improved attitudes, and less educated and low income groups tended to worsen over time/treatment. The increasing maladjustment or negativity to parenting and/or their infant in the latter groups may indeed contribute to or even exacerbate symptoms, as these also constitute the risk factors for more chronic maternal depression (Parrott et al., 2008; Pilowsky et al., 2008).

Our findings have a number of limitations. The pragmatic trial design provided useful information on women's treatment preferences and adherence but meant that there was no control group against which to compare the four treatment arms. Although treatment arms did not differ in severity of depressive symptoms, the pragmatic design also led to a high rate of non-compliance. The sample may also have excluded the more depressed mothers since MAMA non-completers tended to be more depressed at baseline and to be at higher social adversity at 44 weeks. This is likely to have diluted our findings of an association between depression and maternal adjustment. As may be expected in longitudinal research, attrition at 44 weeks was high, but the MAMA subscale was sufficiently brief to enable a large sample to complete it at four time points. Finally, it should be noted that validation was based on the full MAMA, on a large sample to complete it at four time points. Finally, it should be expected in longitudinal research, attrition at 44 weeks. This is likely to have diluted our findings of an association between depression and maternal adjustment. As may be expected in longitudinal research, attrition at 44 weeks was high, but the MAMA subscale was sufficiently brief to enable a large sample to complete it at four time points. Finally, it should be noted that validation was based on the full MAMA, on a version designed for prenatal use.

Although we found that earlier remission did not confer added benefit to maternal adjustment in the longer-term, more prolonged exposure to suboptimal attitudes and related behaviour may adversely affect infants, perhaps particularly in the more depressed mothers who may be underrepresent- ed in our sample. It is well documented that infants of mothers with chronic depression are less likely to have secure, organised attachments (e.g. Campbell et al., 2004). Longer follow-up is needed to study the stability of attitudinal change and whether such changes are later reflected in parenting behaviour and adverse infant outcomes.

Role of funding source

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Conflict of interest

All authors confirm that we have no actual or potential conflict of interest including any financial, personal or other relationships with other people or organisations within three (3) years of beginning the work submitted that could inappropriately influence, or be perceived to influence, their work.

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