Impact of a multiple, IVF birth on post-partum mental health: a composite analysis

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BACKGROUND: This study explored the impact of a multiple IVF birth on maternal mental health in the early post-partum period. METHODS: A prospective study of 207 women who had conceived following IVF treatment and followed up at 6 weeks post-partum. Mothers rated their mood using the Edinburgh postnatal depression scale (EPDS) and their baby’s behaviour using the Unsettled and Irregular Behaviour scale. Mothers’ emotional well-being was explored using theme analysis of semi-structured telephone interviews. RESULTS: Of the 175 (84.5%) followed up post-partum, 56 (32%) had a multiple birth (7 triplets, 49 twins). Nearly 16% of mothers in the multiple group scored >12 on the EPDS indicating clinically significant symptoms, which represented a 3-fold increased risk compared to mothers of singletons (Odds ratio = 3.4, Confidence Interval = 1.011–11.618, P = 0.048). Unsettled and irregular infant behaviour was another independent risk factor. Qualitative analysis of interviews identified 12 themes. Mothers of multiples were more likely to express negative themes including ‘tiredness’ (P<0.01), ‘feelings of stress/depression’ (P<0.05) and ‘questioning parenthood’ (P<0.05). Mothers of singletons were more likely to be ‘feeling wonderful’, reflecting their delight in parenthood (P<0.05). CONCLUSIONS: Mothers of multiples are at increased risk of poorer emotional well-being. Clinicians should focus on the psychological benefits of a singleton birth.

Keywords: multiple birth; IVF; emotional well-being; theme analysis; twins

Introduction

The Human Fertilization and Embryology Authority (HFEA), the UK’s independent regulator of fertility treatment and embryo research, have identified a multiple birth as the biggest risk from IVF, with the most recent figures available showing 23.6% of all IVF births in the UK are twin or triplet (HFEA, 2006). A multiple birth brings additional risk to the well-being of the baby due to increased rates of prematurity and low birth weight (ESHRE Capri Workshop Group, 2000; Pinborg et al., 2004) and is a threat to maternal physical health (ESHRE Capri Workshop Group, 2000; Smithers et al., 2003). Despite this it has been argued that the infertile couple’s desire for a multiple birth should take precedence given most twin pregnancies result in few or no complications for the mother and babies (van Wely et al., 2006).

Such arguments rarely acknowledge that a twin birth may be detrimental to the mother’s emotional well-being (Haigh and Wilkinson, 1989; Thorpe et al., 1991). A recent study of mothers of IVF twins found they experienced significantly higher levels of parenting stress and depression and were less likely to say they obtained pleasure from their child than mothers of singletons (Olivennes et al., 2005). Other studies that have included a naturally conceived comparison group have also found significant differences. First time mothers of twins conceiving after fertility treatment experienced lower psychosocial well-being than those conceiving spontaneously (Colpin et al., 1999), while IVF mothers of multiples were found to report greater parenting stress than mothers of singletons, or naturally conceiving mothers of singletons (Glazebrook et al., 2004). Another consideration may be the level of multiplicity and indeed one study found a lower quality of life and increased depression for each additional child (Ellison et al., 2005) and a French study of mothers’ of triplets found a worrying 50% of mothers were experiencing severe psychological difficulties after the birth (Garel and Blondel, 1992).

It is possible that the combination of IVF conception and a multiple birth may even render women more vulnerable to post-natal depression. The social cognitive theory of depression proposes that women for whom motherhood is a highly valued role may be particularly vulnerable to depression if events or difficulties threaten this role (Champion and Power, 1995). For IVF mothers of multiples the babies may themselves become just such a difficulty, if they are very small, sick or hard to care for. Infant behaviour may also impact on how
the mother feels and Beck’s (1996) meta-analysis of 17 studies concluded that there was a significant moderate correlation between post-partum depression and infant temperament (Beck, 1996). The associations between unsettled infant behaviour and maternal mood (McMahon et al., 2001) and between poor infant motor function and risk of post-natal depression (Murray et al., 1996) are concerning for mothers of multiples. A review of qualitative studies of post-partum depression found that one of four themes reflecting the perspectives involved in post-partum depression was an incongruity between expectations and the reality of motherhood (Beck, 2002a). Arguably mothers of multiples may be more likely to experience such a mismatch between their expectations and the reality of motherhood. Multiple births are more likely to be premature which increases the risk of poor cognitive development and the likelihood of behavioural problems (ESHRE Capri Workshop Group, 2000; Bhutta et al. 2002).

Consequently, there is growing concern that IVF mothers, despite being typically well supported emotionally and financially following a planned conception, may be at risk of poorer emotional well-being or even depression if they have a multiple birth (Klock, 2004; Fisher et al., 2005). To date there have been few prospective studies of IVF mothers and little qualitative work to explore how mothers describe how they feel. A large study comparing the experience of pregnancy and motherhood for mothers conceiving naturally and by IVF had interviewed mothers shortly after giving birth as well as collecting data from standardized questionnaires (Glazebrook et al., 2004). These data offered the unique opportunity for a composite analysis, a term introduced by (Yardley and Bishop, 2007) to describe how quantitative and qualitative data can be used together, not simply as a mixed methods approach or to triangulate. Findings from the two methodologies can be merged, thus potentially revealing new insights (Yardley and Bishop, 2007).

This study aimed to provide insight into the experience of first-time IVF motherhood and the impact of a multiple birth on post-partum mental health.

It used a composite analysis to explore the research questions:
(i) Did first-time IVF mothers of twins or triplets have poorer emotional well-being at 6 weeks post-partum compared to IVF mothers of singletons?
(ii) What impact did caring for a more unsettled and irregular baby have on post-partum mental health in mothers of twins or triplets?

Materials and Methods

Design
This study was part of a prospective longitudinal study of psychological outcome and adjustment to parenthood in couples conceiving following IVF treatment (Glazebrook et al., 2004). Couples were recruited to the study at 18 weeks of pregnancy and were sent postal questionnaires at 18 and 28 weeks of pregnancy and at 6 weeks and 1 year post-partum, in addition a telephone interview was carried out at 6 weeks post-partum. Only data from the 6 week post-partum interview and questionnaires are presented here.

Ethics
The study received full ethical approval from the relevant ethics committees. Signed consent was obtained for follow-up and to access information from medical notes.

Sample
Letters were sent to 625 women known to have successfully conceived following treatment for infertility at a research and treatment unit in a UK hospital inviting them to take part in the study. Inclusion criteria were that participants should be at least 18 weeks pregnant; be resident in the UK and English speaking. In addition the present study selected only first time mothers.

Measures
The Edinburgh postnatal depression scale (EPDS) (Cox, 1994) — this ten item self-report scale, developed as a tool for detecting depression in women following childbirth, avoids somatic items which might be influenced by the physiological changes of pregnancy. Higher total scores indicate greater feelings of depression, with women scoring over 12 being most likely to be suffering from a depressive illness. The authors report the scale has a high level of specificity and sensitivity, and using a score of above 12/13 achieved a sensitivity of 86%, and a specificity (proportion of non-depressed women who were true negatives) of 78%. The split-half reliability of the scale was found to be 0.88, and the Cronbach’s alpha coefficient was 0.87 (Cox et al., 1987). This study treated a score of above 12 as indicating women had clinically significant psychological symptoms of depression.

Unsettled and Irregular Behaviour (UIB). This is a sub-scale of the Mother and Baby Scale developed by St. James-Roberts and Wolke (1988). The 29-item scale was developed to explore the idea that some babies are characteristically ‘difficult’ in their style of behaviour and that this reflects true individual differences. The first part of the scale asks mothers to rate 15 specific behaviours on a five-point scale, from 0 ‘not at all’ to 5 ‘very often’. These items form the subscale UIB and scores can range from 0–75.

The authors report high internal consistency for this scale with a Cronbach’s alpha of 0.92. Mothers of multiples were asked to rate each of their babies. The score describing the most irregular and unsettled baby was used in all analyses.

Telephone interview. A semi-structured interview including obstetric information about the type of delivery, birth weight, weeks of gestation, infant health complications and time spent in the Special Care Unit. This was followed by open-ended questions, including how the labour went, how the mother was feeling in herself, what impact the birth had had on her relationship with her partner and anything else she would like to add about her experiences. The present study focused on the obstetric information and replies to the question ‘how are you feeling in yourself at the moment?’

Procedure
Demographic information was obtained by questionnaire at 18 weeks of pregnancy. Details of fertility treatments were obtained from medical notes. Mothers were contacted by telephone 6 weeks post-partum. Mothers who did not wish to complete the interview over the telephone or who were unobtainable were posted the written version of the interview. A few mothers requested that the interview was not taped and so notes were taken during the interview and used instead. These notes were taken routinely and were used in the event of equipment failure. Some interviews could not take place at around 6 weeks as discharge to home was delayed due to the babies and or the mother being ill after delivery. In these cases the mother was asked to reflect on how she had felt 6 weeks after birth.
The semi-structured interview was carried out first and then the UIB was administered verbally, unless the mother asked to be sent the written version instead. After the interview the mothers were sent the EPDS. All the taped interviews were recorded and then transcribed verbatim. Obstetric details of mothers lost to follow-up were obtained from the medical notes.

**Analysis**

Quantitative data were analysed using the Statistical Package for the Social Sciences version 13.0. Only scores on the UIB followed a normal distribution and so were analysed using parametric statistics. All other analyses were conducted using non-parametric statistics. Qualitative data were subjected to theme analysis (Boyatzis, 1998). The interview transcripts or written interview schedules were explored for any description about how the mother was feeling. This resulted in the development of 10 themes that described how the mother was feeling, physically or emotionally. Themes were identified at both the manifest and latent level. Themes identified at the manifest level were directly observable in the information. An example of this is the theme ‘feeling fine’, and for this theme, these words or a close paraphrase were identified in the transcripts. Latent level themes were generated inductively from the raw information. An example of this is the theme ‘emotional well-being linked to easy baby and feelings of confidence as a mother’. Although some mothers made the connection themselves for others, the connection was assumed by the researcher based on the mother talking confidently about her role as mother and evidence of her emotional well-being. These themes were continuously debated, refined and moderated by the researchers involved in the project.

In addition two latent themes were generated deductively. Exploration of past theory and research (Champion and Power, 1995; Beck, 2002a) by the principal researcher generated the theme ‘expectations of motherhood or of self as a mother — not met’. In order to meet Mays and Pope’s (2000) exhortation to always look for negative cases in qualitative research, any evidence of expectations being positively surpassed was searched for and this generated the theme ‘expectations of motherhood — surpassed’. After these 12 themes were identified all the transcripts were re-read and the presence or absence of each theme was recorded for all mothers and cross-tabulated with whether she had delivered a singleton or multiple babies (see Table 1 for a full list of themes).

A thematic code was developed by the principal researcher for each theme. This included the five elements identified by Boyatzis (1998) as necessary: a conceptually meaningful label for the theme, a definition, a description of how to know when the theme occurs, a description of any qualifications or exclusions to the application of the theme, and finally, examples of positive and negative instances of the theme taken from the transcripts. The thematic codes were put together to form a codebook that was used by an independent researcher to code a sample of 46 extracts representing all of the 12 themes. Inter-rater agreement was high with concordance for 40/46 extracts (86.9%).

**Results**

Of the 625 women approached by letter, 242 (38.7%) consented to take part in the original study. Of these 207 were first time mothers, three mothers were subsequently lost to contact, three had neonatal deaths and 26 were not available for interview within the study period, leaving 175 (84.5%) mothers to be interviewed. No significant differences were found between those interviewed and mothers who were not interviewed in terms of having a multiple birth, a caesarean section, a baby born prematurely (<37 weeks gestation), a baby below 2.5 kg at birth or a baby admitted to the Special Care Unit. However, mothers not interviewed were significantly more likely to have conceived using donor sperm (12.9% versus 2.3%, Fisher’s Exact Test \( P = 0.021 \)).

The majority of mothers (119) had a singleton birth, 49 mothers had twins and seven triplets. The mothers of twins and triplets were combined to form a group of 56 mothers of multiples. The total multiple delivery rate was 32% in this study.

The mothers of multiples were significantly younger than the mothers of singletons with a median age of 33 compared to 34 for the mothers of singletons (\( z = -2.497, P = 0.013 \)). At the time of interview, mothers of multiples were significantly weeks post-partum (median number of weeks post-partum 11.5 versus 7.7, \( z = -6.039, P < 0.001 \) (see Table 2). There were no significant differences between the mothers of singletons and multiples for social class, number of years with partner, months to conceive, type of treatment cycle conceived on, or conception by donor egg or sperm. As anticipated, mothers of multiples were significantly more likely to have a

**Table 1:** Identified themes and the percentage of singleton \((n = 119)\) and multiple \((n = 56)\) mothers in whose transcripts each theme was identified

<table>
<thead>
<tr>
<th>Theme</th>
<th>Number and % of singleton mothers</th>
<th>Number and % of multiple mothers</th>
<th>( P ) values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feeling wonderful(^a)</td>
<td>39 32.8%</td>
<td>9 16.1%</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>Feeling tired(^b)</td>
<td>31 26.1%</td>
<td>26 46.4%</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Feeling down depressed or emotionally stressed now or earlier(^c)</td>
<td>5 4.2%</td>
<td>8 14.3%</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>Emotional well-being—worry over the baby or babies(^d)</td>
<td>21 17.6%</td>
<td>18 32.1%</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>Questioning parenthood(^e)</td>
<td>10 8.5%</td>
<td>4 7.1%</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>Talk of having experienced baby blues(^f)</td>
<td>21 17.6%</td>
<td>3 5.4%</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>Emotional well-being linked to easy baby and feelings of confidence as a mother(^g)</td>
<td>16 13.4%</td>
<td>9 16.1%</td>
<td>NS</td>
</tr>
<tr>
<td>Feeling fine(^h)</td>
<td>52 43.7%</td>
<td>18 32.1%</td>
<td>NS</td>
</tr>
<tr>
<td>Feeling emotionally labile(^i)</td>
<td>6 5.0%</td>
<td>10 17.9%</td>
<td>NS</td>
</tr>
<tr>
<td>Physical health problems or body changes(^j)</td>
<td>16 13.4%</td>
<td>8 14.3%</td>
<td>NS</td>
</tr>
<tr>
<td>Expectations of motherhood or of self as a mother—not met(^k)</td>
<td>15 12.6%</td>
<td>2 3.6%</td>
<td>NS</td>
</tr>
<tr>
<td>Expectations of motherhood surpassed(^l)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^a\)Manifest level theme.

\(^b\)Latent level theme.

\(^c\)Theme generated deductively from past research and theory.
caesarean delivery, a baby born weighing less than 2.5 kg, a baby needing to go to the Special Care Unit, and a baby born prematurely (<37 weeks gestation) (see Table 2).

Did first-time IVF mothers of multiple babies have poorer emotional well-being at six weeks post-partum than mothers of singletons?

Completed EPDS questionnaires were returned by 147/175 mothers. There was a trend for mothers of multiples to have higher EPDS scores ($z = -1.482, P = 0.069$ (one tailed)) and to score above 12 indicating the mother was experiencing clinically significant psychological symptoms of depression [Fisher’s Exact Test, one sided $P = 0.055$] (see Table 3). The qualitative data also revealed differences in the way mothers of multiples and singletons talked about how they were feeling. Twelve themes were identified as described in the analysis section, and of these six discriminated significantly between mothers of multiples or singletons (see Table 1). Three of the themes relate directly to the mothers’ emotional well-being. The mothers of multiples (46.4%) were more likely to talk of being tired without explaining how they compensated for this, or describing how they felt this was not affecting them emotionally, than the mothers of singletons (32.8%), ($\chi^2 = 6.934, df = 1, P = 0.004$) for example:

> Very, very tired have so many sleepless nights. (1045, mother of twins)

A small number of mothers described how they had experienced, or were still experiencing, feelings of stress and or depression. Although overall the numbers were low the theme was identified significantly more often in the transcripts of the multiple mothers (14.3%) compared to the mothers of singletons (4.2%), (Fisher’s Exact Test, one-sided $P = 0.023$), for example:

> So I’m not so good I think I suffered a bit of post natal afterwards. (1129, mother of twins)

Questioning parenthood was a theme reflecting the mother expressing some doubts about her decision with regard to parenthood or with regard to having a multiple birth. This theme was also identified only rarely but again was significantly more likely in the mothers of multiples (7.1%), compared to only one mother (0.8%) in the singleton group, (Fisher’s Exact Test, one-sided $P = 0.037$), for example:

> Have my thoughts, do sometimes think if only there was one. (1295, mother of twins)

Two themes were identified significantly more often in the transcripts of the mothers of singletons. As this was not predicted, two tailed tests of significance were used. The mothers of singletons were more likely to describe having experienced something often described as the ‘baby blues’ (17.6%). Evidence of such a transient mental state was much less common for the mothers of multiples ($\chi^2 = 3.877, df = 1, P = 0.049$), for example:

> Sometimes I felt a bit tearful a bit emotional at the slightest thing. (1033, mother of a singleton)

Mothers also described how well they felt emotionally in terms of the pleasure they felt in their baby. This theme was identified significantly more often in the transcripts of mothers of singletons (32.8%) compared to mothers of multiples (16.1%), ($\chi^2 = 5.336, df = 1, P = 0.033$).

> On cloud nine with her. (1025, mother of a singleton)

The two themes generated deductively as described in the analysis section did not significantly discriminate between the mothers of singletons and multiples however they do illustrate the interaction between expectations and well-being. A proportion of the mothers (13%) did make some mention of how the experience of mothering or motherhood had been different from their expectations in a negative way. Mothers talked of their expectations in a number of ways, some how

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### Table 2: Characteristics of mothers

<table>
<thead>
<tr>
<th></th>
<th>Multiple group ($n = 56$)</th>
<th>Singleton group ($n = 119$)</th>
<th>$P$ values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response rate to telephone interview %</td>
<td>86.2</td>
<td>84.4</td>
<td>NS</td>
</tr>
<tr>
<td>Median number of weeks postpartum (IQ range)</td>
<td>11.5 (9–14)</td>
<td>7.7 (6–9)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Median age (IQ range)</td>
<td>33.0 (30–34)</td>
<td>34.0 (31–37)</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>Number of women in professional, managerial or technical occupations (%)</td>
<td>51 (56.4%)$^b$</td>
<td>75 (63.6%)$^b$</td>
<td>NS</td>
</tr>
<tr>
<td>Median number of months to conceive (IQ range)</td>
<td>48.0 (30–72)$^b$</td>
<td>48.0 (24–63)$^c$</td>
<td>NS</td>
</tr>
<tr>
<td>Number who had Caesarean section (%)</td>
<td>40 (71.4%)</td>
<td>45 (37.8%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Number with baby born weighing &lt;2.5 kg (%)</td>
<td>41 (73.2%)</td>
<td>9 (7.6%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Number with baby born &lt;37 weeks (%)</td>
<td>33 (62.3%)$^b$</td>
<td>13 (11.2%)$^b$</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Number with baby admitted to Special Care Unit (%)</td>
<td>27 (48.2%)</td>
<td>9 (7.6%)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

IQ range: interquartile range.

$^a$Data are missing for one participant.

$^b$Data are missing for three participants.

$^c$Data are missing for six participants.

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### Table 3: EPDS scores

<table>
<thead>
<tr>
<th></th>
<th>Multiple group ($n = 46$)</th>
<th>Singleton group ($n = 105$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median EPDS (IQ range)</td>
<td>6.0 (3–11)$^b$</td>
<td>5.0 (3–8)$^b$</td>
</tr>
<tr>
<td>Number of EPDS &gt;12 (%)</td>
<td>7 (15.6%)$^a$</td>
<td>6 (5.9%)$^b$</td>
</tr>
</tbody>
</table>

$^a$Data are missing for one participant.

$^b$Data are missing for three participants.
they found motherhood hard work or more difficult than they had expected. For example:

I think the first 6 weeks were bad. I wasn’t prepared for the just total 24 h commitment to somebody else. I don’t know if it was my age or just because I hadn’t come to terms with it and then suddenly I was faced with them. (1291, mother of twins)

Others talked of the very high expectations they had of themselves as mothers, for example:

The only thing I’m finding hard is not having one to one contact with either of them. Feel like a production line putting one down to deal with the other. (1107, mother of twins)

Other mothers talked of how the reality of motherhood was different from their expectation, for example:

It was not how I expected to feel. I suppose you have a lot of expectations. After been trying to have a baby for 8 years it’s hard to show you are feeling a bit down. (1041, mother of a singleton)

Mothers’ accounts were also explored for any mention of the experience being better than they had expected. We found very few (4.6%) examples of this, for example:

They’re a handful, but I knew they would be. Everything that’s happened I’ve expected it to be either worse or the same. (1213, mother of twins)

The quantitative and qualitative data triangulated. Four themes were identified significantly more often in the replies from mothers of multiples and could be seen as negative or indicating feelings of low emotional well-being (see Table 1). Mothers whose transcripts revealed these themes had significantly higher EPDS scores indicating lower emotional well-being than mothers whose transcripts did not: ‘feeling down depressed or emotionally stressed now or earlier’ (median score 14 versus 5, \(z = -4.077\), \(P \leq 0.001\)), ‘feeling tired’ (median score 7 versus 4, \(z = -3.239\), \(P \leq 0.001\)), ‘questioning parenthood’ (median score 11 versus 5, \(z = -1.935\), \(P \leq 0.05\)) and ‘emotional well being – worry over the baby or babies’ (median score 8 versus 5, \(z = -3.826\), \(P \leq 0.001\)). However mothers whose transcripts revealed the theme ‘talk of having experienced the baby blues’ did not score significantly higher on the EPDS. The theme ‘feeling wonderful’ was identified significantly more often in the replies of mothers of singletons. Mothers whose transcripts revealed this theme scored, as expected, significantly lower on the EPDS indicating greater emotional well-being (median score 3.5 versus 6, \(z = -2.504\), \(P \leq 0.01\)).

What impact did caring for a more unsettled and irregular baby have on post-partum mental health in mothers of twins or triplets?

Babies rated as more unsettled and irregular had mothers with higher EPDS scores indicating poorer emotional well-being (\(r_s = 0.453\), \(n = 139\), \(P < 0.001\)). In order to explore the additional effect of a multiple birth on mental health a logistic regression was conducted with EPDS score \(> 12\) as the dependent variable and multiple birth (yes/no), maternal age, caesarean delivery, weeks post-partum, and UIB scores as independent variables. Infant temperament entered first but once this was controlled for a multiple birth created a significant 3-fold risk of an EPDS score \(> 12\) (see Table 4).

In order to investigate any additional impact of a triplet birth the logistic regression was repeated as above using number of babies as the independent variable instead of multiple births. Once UIB score was controlled for each additional child doubled the chance of the mother having an EPDS score \(> 12\) but this just failed to reach significance (Odds ratio (OR) = 2.2, confidence interval (CI) = 0.904–5.393, \(P = 0.08\)).

The theme ‘emotional well-being linked to worry about the baby’ explains the interaction between the mother’s well-being and how she experiences her baby and was identified in the transcripts of some mothers (22.3%). These mothers were found to rate their babies on the UIB as significantly more unsettled and irregular (\(n = 32\), mean = 41.38) compared to mothers whose transcripts had not revealed this theme (\(n = 119\), mean = 33.61), \(t = -2.941\), df = 149, \(P = 0.04\) (2 tailed). This theme was also identified significantly more often in the transcripts of mothers of multiples (32.1%) than in mothers of singletons (17.6%) (\(\chi^2 = 3.821\) df = 1, \(P = 0.025\)), for example:

Mentally I feel good on a good day if they cry a lot I feel bad. (1079, mother of twins)

However there were no significant differences in UIB scores between multiples and singletons.

### Discussion

Despite appearing a low risk group for post-natal depression, 8.8% of the first time mothers in this study scored above 12 on the EPDS indicating clinically significant symptoms of depression. In answer to the first research question (did first-time IVF mothers of twins or triplets have poorer emotional well-being at 6 weeks post-partum compared to IVF mothers of singletons?). We found a trend towards significance for mothers of multiples to score higher on the EPDS and to score above the cut-off, with 15.6% scoring above 12 compared to only 5.9% of the mothers of singletons. These findings support Klock’s (2004) suggestion in her review of the psychological adjustment to twins after infertility, that mothers of multiples will be more vulnerable to depression. Analysis of the qualitative data also suggested a more negative experience and poorer emotional well being for the mothers of multiples. The mothers of multiples’ accounts offered some support for the findings of other researchers that mothers struggle to meet the needs, and treat as individuals, twins or triplets (Garel and Blondel, 1992; Holditch-Davis et al., 1999; Beck, 2002b).
The finding that the theme ‘questioning parenthood’ was more common in mothers of multiples might be considered controversial since mothers of singletons could not express doubts about a multiple birth. The theme has been retained because, although rare, it emerged from the data at the manifest level. Theoretically it was quite possible for mothers of singletons to express doubts relating to decisions about parenthood but only one mother did so.

An unexpected finding was that mothers’ of singletons were significantly more likely to mention having experienced what was termed ‘talk of having experienced baby blues’. Reflection suggests what was important for these mothers was that their experience of poorer emotional well-being had been identified by themselves and in some cases by health professionals as well; as temporary, clearly over now and was common among new mothers. This was in contrast to the theme ‘feeling down, depressed or emotionally stressed now or earlier,’ which reflected a distress seen as atypical, more disabling and not transitory.

In answer to the second research question (what impact did caring for a more unsettled and irregular baby have on post-partum mental health in mothers of twins or triplets?), multiple infants were not rated as significantly more irritable or irregular. There was a strong correlation between mothers’ ratings of infants’ irritability and irregularity, and the mothers’ EPDS scores. More difficult infant temperament was associated with poorer post-partum mental health. Controlling for infant temperament resulted in a threefold increase in risk of scoring above the EPDS cut-off for depression in mothers of multiples. This suggests that the combination of a difficult infant and a multiple birth increases the mother’s emotional vulnerability. This confirms previous work suggesting infant temperament may combine with other vulnerability factors to increase the risk of depression (Cutrona and Troutman, 1986; Murray et al., 1996). Repeating the regression with number of babies rather than multiples showed support for Ellison and colleagues finding of an increased risk of maternal depression with each increase in multiplicity (Ellison et al., 2005), although a trend rather than statistical significance was achieved in our analysis, probably reflecting the lack of power due to the small numbers of mothers with triplets.

The themes ‘emotional well-being linked to worry over the baby’ and ‘emotional well-being linked to easy baby and feelings of confidence as a mother’ provide further support for the impact of the baby’s behaviour on the mother’s emotional well-being found in the quantitative analyses. These findings concur with those of other researchers in highlighting the potential protective function of an ‘easy’ baby (Beck, 1996; Murray et al., 1996). More recently Pridham et al. (2001) have shown that a mothers’ evaluation of care giving, in terms of meeting expectations of herself as a mother, were influenced by her infant’s positive feeding behaviour and responsiveness.

One of the most interesting themes to appear inductively was the theme ‘feeling wonderful’. Exploration of the literature had suggested that mothers of multiples might experience poorer emotional well-being after the birth however this theme revealed a more subtle shift in emotions with mothers of multiples merely expressing less delight than the mothers of singletons. This reflects the finding by Olivennes et al. (2005) that fewer mothers of twins (76%) than singletons (89%) in their study reported feelings of enormous pleasure.

The initial response to the invitation to participate in the study was low. Women were being asked to commit to a longitudinal study while still in the early stages of pregnancy and van Balen et al. (1996) have suggested a response rate of around 40% for this type of research is to be expected. Once recruited to the study a high retention rate was achieved (87%). Whilst the low initial response rate may limit the generalization of the findings, women accepting the invitation to participate in the study were found to be representative of a random sample of 100 women receiving treatment at the same clinic at the time of the study (Glazebrook et al., 2000). Moreover the demographic profile of the mothers: older age and higher social class is typical of women seeking IVF treatment (Kalra et al., 2003). The only factor that impacted significantly on both the initial response rate (Glazebrook et al., 2000), and participation in the post-partum interview was conception using donor sperm. This may reflect a desire by the mother to ensure privacy and protect her partner. The rate of multiples (32%) is higher than current national rates (23.6%) because the study was carried out before the introduction of the HFEA guidelines restricting the number of embryos transferred to no more than two except in exceptional circumstances. As expected in a sample of previously infertile women the majority of women responding to the initial invitation to take part in the research (86%) were primiparous. Only first time mothers were included in this study so the impact of a multiple birth on an inexperienced mother could be explored.

This study did not include control groups of naturally conceived singletons and multiples and this could be seen as a limitation. However, the aim was to explore the impact of a multiple birth on a first time IVF mother, not to compare or contrast the experience of a multiple birth for mothers conceiving naturally or after IVF. Including a naturally conceived control group of multiples would make matching for mothers’ age difficult as naturally conceived multiples are more common in older mothers (Office for National Statistics, 2005), whereas IVF conceived multiples are more common in younger women, reflecting their increased likelihood of a live birth regardless of the number of embryos transferred (Schieve et al., 1999).

While scoring above 12 on the EPDS cannot be seen as indicating that a mother is experiencing post-natal depression, it is a useful tool for detecting feelings of depression and poor emotional well-being and cut-off scores are widely used to indicate mothers are experiencing clinically significant psychological symptoms. Murray and Carothers (1990) have demonstrated the acceptability of the EPDS to a large representative community sample, with a response rate of 97.3% to a postal questionnaire, and report that using a cut-off point of above 12 they were able to correctly identify over 80% of mothers with major depression and 50% of those with minor depression.

This study was prospective and with the exception of maternal age and number of week’s post-partum at follow-up, the groups were well matched. Maternal age and week’s post-partum were both controlled for in the quantitative analyses. During the interviews, mothers were requested to reflect on how they had felt at 6 weeks when collecting
the qualitative data. Mothers of multiples tended to talk of how they were now in more of a routine and had been more tired previously, although potentially they could have been influenced by a greater number of sleepless nights. The comparable response rates for mothers of multiples and singletons strengthened this study. However, the major strength was the collection of both qualitative and quantitative data from a large cohort of women conceiving through IVF. The emergence of the theme ‘feeling wonderful’ illustrates the advantages of a composite approach. Although both the qualitative and quantitative data found evidence of poorer emotional well-being and post-partum mental health with multiples, this unexpected theme enables the emphasis to move from the disadvantages of a multiple birth to the positive impact of a singleton birth.

Only by better informing prospective IVF parents about the range of risks associated with a multiple birth will we, as Bryan exhorts successfully, challenge ‘the common belief that twins bring unqualified joy from conception onwards’ (page 241, Bryan, 2002). Research has shown that increased knowledge of the risks of pregnancy complications influenced the desire for a multi-fetal gestation (Groban et al., 2001), and providing accurate information about the risks of a twin pregnancy meant men and women rated such a pregnancy as less favourable (Newton and McBride, 2005). However couples ‘may understand the risks associated with triplets but be naïve with respect to twins’ (page 1425, Ellison et al., 2005). This view is supported by a recent study looking at the attitudes of IVF patients’ towards elective single embryo transfer which found that the health risks of twins had been little discussed and that couples understood the ‘risk of twins’ as referring to their chance of conceiving twins (Porter and Bhattacharya, 2005) and by the finding that a preference for multiples was associated with a lack of knowledge of the risks of twins (Ryan et al., 2005).

Couples not only need information about the physical risks of a multiple birth but also about the potential consequences for mental health. The emotional difficulties in the post-partum period, found in this study, may persist through the early years, particularly as mothers of multiples have been shown to be less likely to return to work, rendering them more vulnerable to depression (Glazebrook et al., 2004; Olivennes et al., 2005). Despite evidence about the benefits of single embryo transfer, including decreased economic costs (Ledger et al., 2006) and obstetric and neonatal outcomes comparable to that of spontaneously conceived singletons (De Neubourg et al., 2006), only 9.1% of UK embryo transfers between 2002 and 2003 were single embryo (HFEA, 2005). One way to promote single embryo transfer may be to reframe the information for prospective parents, focusing not on the risks associated with a multiple birth but on the benefits of a singleton birth.

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