

Original contribution

Perceived and observed mother–child interaction at time of hospitalization and release in postpartum depression and psychosis

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Summary

Introduction: A pilot study was conducted which compared perceived mother–infant bonding in women admitted with postpartum depression or psychosis, with observations of mother–infant interaction by the nursing staff at both the time of hospitalization and that of release.

Method: 25 mother–infant pairs admitted to a psychiatric unit were included in this study. The Postpartum Bonding Questionnaire was used to assess the perceived mother–infant bond and the observation of mother–infant interaction was assessed with the Bethlem Mother–Infant Interaction Scale.

Results: At the time of both hospitalization and release postpartum depressed women experienced the bond with their child significantly more negative than women with postpartum psychosis. In contrast to women with postpartum psychosis, the experience of postpartum depressed women was significantly correlated with the observations of the nursing staff at time of release.

Conclusion: Treatment that focuses on a mother's experience of the bond with her child could be especially beneficial for mothers with postpartum depression.

Keywords: Postpartum depression; postpartum psychosis; mother–infant bond; mother–infant interaction

Introduction

The development of an emotional relationship between mother and child is a central psychological process after childbirth. Interrupted development of a secure mother–infant bond can lead to long-term problems in the child's emotional, cognitive, and behavioral develop-

ment (Murray and Cooper 1997). Difficulties with this important process can arise when the new mother suffers from a postpartum psychiatric disorder. One of the most common psychiatric disorders in the puerperium is postpartum depression, which affects approximately 10–15% of new mothers in Western countries (O'Hara and Swain 1996; Warner et al. 1996). A less common, but often more severe illness than postpartum depression is postpartum psychosis, which affects about 1–2 women per 1000 births (Brandon 1983; Kendell et al. 1987). Despite the rarity of these severe postpartum psychiatric disorders, it is of great importance to study their effects on the development of the newborn child.

Previous research has demonstrated the negative effect of postpartum depression and postpartum psychosis on the observed bond between mother and child (Righetti-Veltma et al. 2002; Chandra et al. 2006; Hornstein et al. 2006). Moreover, a weaker bond between a mother and her child can lead to problems in the emotional, cognitive, and behavioral development of the child (Field et al. 1990; Murray and Cooper 1997; Righetti-Veltma et al. 2002). Tronick and Weinberg (1997; cited in Reck et al. 2004) characterized mother–infant interaction as a flexible process with frequent shifts between matches – positive affective states – and mismatches – negative affective states. The authors stated that in a normal play situation with mothers who suffer from postpartum depression and their child, only 30% of the playtime included a match of affect. Because of the small amount of

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congruence, the development of children is negatively affected. Postpartum psychiatric disorders have effects in the long term as well. Previous research has demonstrated the negative effect on mother–infant bond in the long term. Hipwell et al. (2000) demonstrated that depression in the postpartum period resulted in insecurity in the mother–infant bond 1 year after childbirth. Therefore, early detection and treatment procedures are of vital importance because the effects of postpartum depression and postpartum psychosis go beyond the mother alone. Counselling and treatment might prevent later mental health problems of both mother and child.

A recent study by Hornstein et al. (2006) focused on assessing the emotional dimension of the mother–child relationship by exploring the self-perception of feelings of mothers with postpartum depression and postpartum psychosis. The authors reported an association between the experience of the mother regarding the bond with her child and the observed interaction between mother and child when the mother suffers from postpartum depression or postpartum psychosis. As far as we know, no previous studies have examined the experience of mothers with postpartum depression or postpartum psychosis regarding the bond with their child at different moments in time. For women with a postpartum psychiatric disorder, it is important to study the mother's experience of the bond with her child because additional information on this topic could underline the importance of particular treatment regimens. More specifically, the recovery process of the mother might benefit from an improved perception of the quality of the bond with her child, whereas an improved perception might also lead to a faster recovery. This would underline the importance of, e.g., video interaction guidance (Vik and Hafting 2006), in which the focus lies on helping the mother form a more realistic picture of the relationship with her child.

The main questions in the present study are the following. Are there differences between mothers with postpartum depression and mothers with postpartum psychosis concerning the experience of the bond with their child at time of hospitalization and at time of release from the psychiatric unit? Are there differences between mothers with postpartum depression and mothers with postpartum psychosis regarding the observations of the nursing staff at time of hospitalization and at time of release from the psychiatric unit? Do the experience of mothers with postpartum depression or postpartum psychosis and the observations of the nursing staff show correlations at time of hospitalization and at time of release from the psychiatric unit?

It is expected that women with a postpartum depression will experience the interaction with their child as more negative compared with women with a postpartum psychosis and that at time of release this difference is diminished. This is to be expected because feelings of inadequacy, negative cognitions, and self-doubt influence the bonding experience of depressive mothers (Hornstein et al. 2006). In general, depressed patients perceive themselves negatively (Lewinsohn et al. 1980) and have the tendency to accept more personal responsibility for failure. Furthermore, research has shown that people with a depression remember less positive and more negative information about themselves (Kuiper 1978). Moreover, it is to be expected that women with postpartum depression will experience the bond with their child more negatively compared with the observations of the nursing staff and that the difference is diminished at time of release. The opposite is expected for women with a postpartum psychosis, namely, that they experience the mother–infant interaction as more positive compared with the observations of the nursing staff, and that the difference is diminished at time of release. A reason for this expectation is the finding of Robertson and Lyons (2003), who demonstrated that women with a postpartum psychosis have a limited perception of the mental consequences of their illness, which is only perceived by them in biological terms. This finding suggests that women with a postpartum psychosis might not have a realistic image of their illness either. We expect that this nonrealistic view is of influence on the experience of mothers with postpartum psychosis regarding the bond with their child. Therefore it is expected that such realism will improve during treatment and that the experience of mothers with a postpartum depression or a postpartum psychosis of the bond with their child and the observations of the nursing staff will be more correlated at time of release.

Sample and method

Population and procedure

The sample included 25 mother–infant pairs who were admitted to the psychiatric mother–baby unit of the Erasmus Medical Centre between June 2005 and November 2006. Inclusion in the study depended on having a diagnosis of either postpartum depression (13 patients) or postpartum psychosis (12 patients) and having completed the questionnaires used in this study. The psychiatric diagnosis was based on the Structural Clinical Interview for DSM-IV (SCID). The postpartum depression group consisted of women with the diagnosis postpartum depression ($n = 10$) or social phobia with depressive features ($n = 2$). In the postpartum psychosis group, 7 women suffered

from a psychotic relapse postpartum of a known bipolar disorder. Six women were not known bipolar; however, their postpartum psychosis could be seen as the first manifestation of an underlying bipolar disorder (Chaudron and Pies 2003). Women with a diagnosis of schizophrenia were excluded. There was an inability to include women with schizophrenia in this study because either their child was not admitted to the psychiatric unit or the mother had lost her parental rights because of the disorder.

All women received treatment in line with the medical guidelines of the Dutch Association of Psychiatry. The women in the sample all received medical treatment. Women with postpartum psychosis were treated with lithium and in the majority of cases haloperidol and lorazepam was given as well during the acute phase in the first 2 weeks. In the postpartum depression group, women were treated with either tricyclic antidepressants or a selective serotonin reuptake inhibitor. In addition to pharmaceutical treatment, interventions regarding the mother–child relationship took place. These interventions included video intervention, feedback from nursing staff, and a therapy group for the mothers. Women with postpartum depression and postpartum psychosis were equally exposed to these interventions. Additionally, previous research has demonstrated the lack of effect of antidepressive treatment alone on mother–child interaction when the mother suffers from postpartum depression (Forman et al. 2007).

During admission, questionnaires were completed on a weekly basis. The study has been approved by the Medical Ethics Committee of the Erasmus Medical Centre, Rotterdam. Written informed consent was obtained from all participants and their partners. When the women who were admitted were unable to give informed consent, informed consent was obtained first from their partners. When the women were sufficiently recovered, usually within 4 weeks, an informed consent was obtained from the women themselves. Women were free at all times to withdraw their consent.

Measures

To assess the observations of the nursing staff, the Bethlem Mother–Infant Interaction Scale (BMIS) was used (Hipwell and Kumar 1996). The BMIS is a well-validated measure designed to assess the quality of interaction between mothers and babies who are jointly admitted to a psychiatric unit of a hospital. The BMIS consists of 7 subscales of which the first 4 may be regarded as measures of the mother’s contribution to the dialogue with her baby. The subscales are the following: eye contact, physical contact, vocal contact, mood, general routine, physical risk to the baby, and baby’s contribution to interaction. Ratings are made on a 5-point scale, with 0 indicating that the mother was judged to be interacting with her child in an appropriate, sensitive, and well organized way, and with the maximum score of 4 indicating very severe disturbances which result in physical separation. The BMIS was completed by the nursing staff. Previous research demonstrated that there often is a lack of variation in scores between the scales “routine” and “danger for the baby” (Kumar and Hipwell 1996). To reduce the risk of losing valuable results, it was decided to not remove the two scales from the start. Research on the reliability of the BMIS demonstrated a very high internal consistency, namely, 0.93. The interrater reliability for the different scales was found to

range from 0.44 to 0.97 (Kumar and Hipwell 1996). A limitation of the BMIS is the lack of cutoff scores.

The Postpartum Bonding Questionnaire (PBQ) was used to assess the experience of the mother regarding the bond with her child (Brockington et al. 2001). The PBQ is a self-report screening instrument specifically targeted at disorders of the early mother–infant relationship and is a well validated measure in particular for postpartum depressed patients. The PBQ covers 25 items which are rated on a 6-point Likert scale including the labels “always”, “very often”, “quite often”, “sometimes”, “rarely”, and “never”. A higher score indicates more pathological responses. Scale 1, impaired bonding, consisting of 12 items with a cutoff score of 12 and a maximum score of 60, describes a general factor; scale 2, rejection and anger, comprises 7 items and has a cutoff score of 13 and a maximum score of 35; scale 3, anxiety about care, is composed of 4 items and has a cutoff score of 10 and a maximum score of 20; and scale 4, risk of abuse, covers 2 items with a cutoff score of 2 and a maximum score of 10. The most recent validation study of the PBQ by Brockington et al. (2006) demonstrated sensitivity and specificity rates for the 4 scales of 0.28, 0.89, 0.82, and 0.13 and 0.68, 0.95, 0.64, and 0.20, respectively. The authors make no claims regarding the reliability of measuring the mother–infant relationship.

The Clinical Global Impression (CGI) was used to assess the severity of the disorder (Guy 1976). Ratings are made by a clinician in order to assess the overall severity of an individual’s symptoms and changes in functioning over time. The CGI is a 7-point scale, a score of 1 is “not at all ill” and a score of 7 is “the most severely ill”.

All questionnaires were completed at time of hospitalization, T1, and at time of release, T2, and were available for all women.

Statistical analysis

To examine differences between the diagnostic groups, women with postpartum depression and women with postpartum psychosis, bivariate analyses were conducted. The chi-square test was used to examine the differences in basic characteristics between mothers with postpartum depression and mothers with postpartum psychosis. Independent sample *t*-tests were used to analyze whether women with a postpartum depression and women with a postpartum psychosis demonstrated score differences in the two different measures.

Spearman rho correlations were used to determine the correlations between the PBQ and BMIS in the first and final week of admission.

Results

Demographics

The sample characteristics are presented in Table 1. Women with a postpartum depression and women with a postpartum psychosis significantly differed in their length of admission to the psychiatric unit of the hospital. Women suffering from a postpartum depression were significantly longer admitted to the hospital than were women with a postpartum psychosis. The children of women

Table 1. Sample characteristics of the mother–infant pairs admitted to the Erasmus Medical Centre

Characteristic	Value for group:		Group difference	
	Postpartum depression (<i>n</i> = 13)	Postpartum psychosis (<i>n</i> = 12)	<i>t</i> or χ^2	Sign.
Mean age (SD) of mother at hospitalization (yr)	32.16 (5.20)	31.73 (5.33)	0.21	0.84
Mean age (SD) of child at hospitalization (mo)	2.29 (1.56)	0.99 (0.85)	2.56	0.02
Mean length (SD) of admission (mo)	2.76 (1.40)	1.94 (0.78)	1.78	0.04
Marital status (nr. [%])			2.01	0.16
Relationship, not living together	2 (15.4)	0 (0)		
Relationship, living together	11 (84.6)	12 (100)		
Education (nr. [%])			5.28	0.51
Primary education	3 (23.1)	0 (0)		
Secondary education	7 (53.9)	7 (58.3)		
Higher education	3 (23.1)	5 (41.7)		
Parity (nr. [%])			7.86	0.05
1	7 (53.8)	11 (91.7)		
>1	6 (46.2)	1 (8.3)		
Gender infant (nr. [%])			0.02	0.89
Male	9 (69.2)	8 (66.7)		
Female	4 (30.8)	4 (33.3)		
Psychiatric history (nr. [%])			3.22	0.07
No psychiatric history	4 (30.8)	8 (66.7)		
Psychiatric history	9 (69.2)	4 (33.3)		
Mean score (SD) CGI				
At time of admission	5.08 (0.86)	5.08 (1.17)	−0.16	0.98
At time of release	3.08 (1.26)	2.42 (1.00)	1.45	0.16

with a postpartum psychosis were significantly younger, at time of hospitalization of the mother, compared with the children of women with a postpartum depression.

Experience of bonding (PBQ)

Women suffering from a postpartum depression reported significantly higher scores on the PBQ in the first week

of admission compared with women with a postpartum psychosis. Significant differences were found on the scales “impaired bonding”, “rejection and anger”, and “anxiety about care”. Remarkable are the rather low scores on the PBQ at time of admission. It is of importance to note here that women with postpartum depression have a mean score above the cutoff score for the scale “impaired bonding”. For women with postpartum

Table 2. Subjective and objective measures of bonding experiences and the mother–infant interaction

Measure and scale	Mean score (SD) for group:				Sign. of group difference at:	
	Postpartum depression (<i>n</i> = 13)		Postpartum psychosis (<i>n</i> = 12)		T1	T2
	T1	T2	T1	T2		
PBQ						
Impaired bonding	13.77 (12.23)	8.54 (10.44)	3.42 (3.48)	1.83 (3.07)	0.01	0.04
Rejection and anger	7.92 (7.63)	5.15 (6.15)	1.92 (2.54)	0.92 (1.62)	0.02	0.03
Anxiety about care	5.23 (4.00)	3.00 (2.89)	1.42 (1.73)	0.92 (1.31)	0.01	0.03
Risk of abuse	0.08 (0.28)	0.08 (0.28)	0.00 (0.00)	0.08 (0.29)	0.35	0.96
BMIS						
Eye contact	0.92 (1.12)	0.69 (1.18)	1.33 (1.23)	0.33 (0.49)	0.39	0.34
Physical contact	1.00 (1.16)	0.69 (1.18)	1.42 (1.00)	0.42 (0.52)	0.35	0.46
Vocal contact	1.15 (1.21)	0.77 (1.24)	1.50 (1.17)	0.50 (0.52)	0.48	0.49
Mood	1.23 (1.09)	0.77 (1.24)	1.58 (1.08)	0.50 (0.67)	0.43	0.51
Routine	0.77 (1.17)	0.46 (1.13)	1.50 (1.68)	0.00 (0.00)	0.13	0.17
Danger for baby	0.31 (1.11)	0.31 (1.11)	0.67 (1.16)	0.00 (0.00)	0.44	0.35
Condition of baby	0.46 (1.13)	0.31 (1.11)	0.50 (1.16)	0.08 (0.29)	0.93	0.50

psychosis the mean score is rather low regarding the point in time, namely, at time of admission.

Again at T2, the scores on the scales “impaired bonding”, “rejection and anger”, and “anxiety about care” were significantly higher for women with postpartum depression when compared with the scores of women with a postpartum psychosis (Table 2). At T2, all scores are below the cutoff scores, which indicates an improvement for both groups on the main scales “impaired bonding” and “rejection and anger”. The score on “anxiety about care” diminished as well. We removed the scale “risk of abuse” from further analysis since only a very limited risk was found in the depressed group and no risk in the psychotic group. Furthermore, previous research has demonstrated that this scale is not associated with any form of bonding disorders (Brockington et al. 2001).

Mother–infant interaction (BMIS)

Table 2 demonstrates that the mother–infant interaction observed by the nursing staff did not significantly differ between women with a postpartum depression and women with a postpartum psychosis. No significant differences were found in either the first week of admission, T1, or in the final week of hospitalization, T2. However, in spite of the small nonsignificant differences, the scores at time of admission to the hospital, as observed by the nursing staff, tend to be higher for all subscales of women with postpartum psychosis compared with those of depressed patients. At T2, the opposite was found; the

scores at time of release from the psychiatric unit, as observed by the nursing staff, tend to be lower for all subscales of women with postpartum psychosis compared with those of the women from the postpartum depression group. Again, it must be pointed out that these differences were not significant.

Correlations

Table 3 presents the Spearman rho correlations for the two groups. Several correlations were identified for the postpartum depression group. At T1, scores on the 3 scales of the PBQ correlate with “physical contact”, the second scale of the BMIS, and the scores on a specific scale of the PBQ, “rejection and anger”, correlate with “eye contact” as well as with “vocal contact”.

At T2, more scales of the PBQ and the BMIS correlate with each other for the postpartum depression group. These correlations are stronger compared with the correlations at T1. All the correlations are significant; the exception being found in the correlations of the two final scales of the BMIS (danger for the baby and condition of the baby) with the analogous scales of the PBQ. Thus, the scores of the mothers on the PBQ and those of the nursing staff on the BMIS are more comparable at T2.

The postpartum psychosis group demonstrated no significant correlations. Consistent with previous research (Kumar and Hipwell 1996), the correlations of the scales “routine” and “danger for the baby” indeed could not be calculated because of a lack of variation of the scores.

Table 3. Association between PBQ and BMIS (Spearman rho correlations) for depressive and psychotic mothers

	Postpartum depression (n = 13)			Postpartum psychosis (n = 12)		
	Impaired bonding	Rejection and anger	Anxiety about care	Impaired bonding	Rejection and anger	Anxiety about care
T1						
Eye contact	0.39	0.55*	0.48	0.49	0.21	0.12
Physical contact	0.65*	0.74**	0.63*	0.39	0.23	0.06
Vocal contact	0.53	0.65*	0.51	0.21	0.04	0.03
Mood	0.17	0.29	0.30	0.40	0.31	−0.06
Routine	0.00	0.15	0.50	0.39	0.34	−0.32
Danger for baby	0.04	0.27	0.39	0.26	0.31	−0.43
Condition of baby	−0.29	−0.12	−0.06	0.16	0.18	−0.34
T2						
Eye contact	0.68*	0.64*	0.65*	−0.03	−0.09	0.00
Physical contact	0.68*	0.64*	0.65*	20.21	−0.20	−0.14
Vocal contact	0.72**	0.68*	0.67*	0.03	−0.32	0.05
Mood	0.87***	0.89***	0.85***	−0.16	−0.08	−0.09
Routine	0.69**	0.75**	0.72**			
Danger for baby	0.39	0.43	0.43			
Condition of baby	0.39	0.43	0.43	−0.32	−0.21	−0.25

* p < 0.05; ** p < 0.01; *** p < 0.001.

Discussion

This study aimed to increase the knowledge of a mother's experience of the bond with her child when the mother is suffering from either postpartum depression or psychosis. Our study is, as far as we know, the first study which compared the experience of women with a postpartum psychiatric disorder, regarding the bond with their child, with the observations of the nursing staff at different moments in time, namely, at time of hospitalization and at time of release from the psychiatric unit.

Differences were being found in the demographic characteristics of the mothers and their children. With respect to the result that mothers with a postpartum depression were admitted longer to the psychiatric unit of the hospital than were mothers with a postpartum psychosis, a possible explanation could be derived from previous research. A meta-analysis has demonstrated that women suffering from a postpartum depression can have long episodes. Between 25 and 50% of these women even have episodes lasting 6 months or longer (Beck 2002). A significant difference was also to be found in children of women with a postpartum psychiatric disorder. It is not surprising that children of women suffering from a postpartum depression were significantly older at time of admission compared with children of women with postpartum psychosis. Because the onset of postpartum psychosis is often much more abrupt and severe compared with the onset of postpartum depression. New mothers can develop, amongst others, paranoid or bizarre delusions as early as 2 days after childbirth (Kendell et al. 1987; Sit et al. 2006).

We had expected that women with postpartum depression would experience the bond with their child more negatively compared with women with postpartum psychosis. In line with our expectations, significant differences were found between women with postpartum depression and women with postpartum psychosis regarding their experience of the bond with their child. As seen in the study by Hornstein et al. (2006), we found that women with postpartum depression experience the bond with their child significantly more negative compared with women with postpartum psychosis. Our hypothesis regarding time of release stated that the experience of the bond of mothers with postpartum depression and postpartum psychosis with their child would demonstrate a smaller difference compared with that at time of admission to the psychiatric unit. However, the study demonstrated that women with postpartum depression show a significantly more negative experience of bond with their child compared with women with post-

partum psychosis at time of release. A possible explanation for the persisting differences could be the nature of the psychopathology. The prognosis of postpartum psychosis is generally favourable. Women go on to recover fully (Robertson and Lyons 2003). In contrast, as mentioned above, women suffering from a postpartum depression can have episodes lasting 6 months or longer (Beck 2002). Although no significant differences were found, the outcome of the CGI suggests that the severity of the illness at time of release from the psychiatric unit is higher for the postpartum depression group; as was confirmed by the observations of the nursing staff with their BMIS scores. The significant difference in the age of the child between the two groups could be found to have an effect on the results. The older age of children in the postpartum depression group could in itself explain the greater problems for this group.

No significant differences were found between mothers with postpartum depression and mothers with postpartum psychosis regarding the mother–infant interaction observed by the nursing staff. However, it is noteworthy to mention that the women with postpartum psychosis show a trend of receiving higher scores at time of admission to the psychiatric unit, which may suggest that according to the nursing staff they have more difficulties in the interaction with their child.

Finally, we had expected that the scoring of the mothers themselves and the nursing staff would show higher correlations at time of release. The data confirmed our expectations for women with a postpartum depression. Thus, the experiences of women with a postpartum depression are more likely to be more similar to the observations of the nursing staff at time of release from the psychiatric unit. In contrast, women suffering from a postpartum psychosis showed, as was to be expected, no significant correlations with the scoring of the nursing staff at time of admission. The experience of the mothers might not be realistic at this point; something which is not surprising bearing in mind that these women suffer from symptoms such as confusion, delusions, paranoia, and hallucinations (Hays 1978; Millis and Komblieth 1992; Wisner et al. 1994). Nevertheless, at time of release from the psychiatric unit, the assessment of the mothers with postpartum psychosis and of the nursing staff did not show significant correlations either. An explanation for these findings is that postpartum psychotic women are more fully recovered at time of release compared with women with a postpartum depression. Due to a lack of variation in the scores of the postpartum psychosis group, since overall scores were low, not all cor-

relations could be calculated for T2. In contrast, women with a postpartum depression still have symptoms of the psychiatric disorder at time of release. As mentioned earlier, long episodes of postpartum depression are not rare. Even at 1 year after childbirth, mothers who have suffered from a postpartum depression report significantly higher perceived stress, lower social support, and lower self-esteem than nondepressed mothers (Wang et al. 2005).

Limitations

This study has some limitations. First of all, it is likely that an information bias is present. The nursing staff, which has the task of observing and assessing the mother–infant interaction, knows the diagnosis of the women who are admitted to the mother–baby unit. This knowledge could influence their scoring of the women with a postpartum psychiatric disorder. For instance, women with a postpartum depression could elicit more sympathy in the nursing staff than women with a postpartum psychosis. Nevertheless, in the present study, the direction of a possible information bias of the nursing staff is not consistent over time. Women with a postpartum depression received indeed a lower score at the start of hospitalization compared with women with a postpartum psychosis. However, at time of release, women in the postpartum depression group have received higher scores from the nursing staff compared with women in the postpartum psychosis group. Furthermore, the statistical power to detect significant differences could be low. Although the group sizes are comparable, the amount of participants is fairly small, which could result in a type II beta error such that a significant effect being present would not be identified. A limitation is that the PBQ was not developed for women with a postpartum psychosis. An interesting result of the study regarding the PBQ is the lack of correlation between the subscale “anxiety about care” of the PBQ and the subscale “danger for the baby” of the BMIS, of which correlation would be expected. A possible explanation for this finding would be the observation that postpartum depression is mainly a problem in fine-tuning of the mother’s behaviour towards her child and not in the more practical interference with mothering. This lack in attunement is demonstrated by the low scores on the BMIS but it did not lead to an observed danger for the baby. However, in other studies the same measure, the PBQ, was used in populations including women with postpartum psychosis as well (Hornstein et al. 2006). Finally, the measures used involved subjective information. Nevertheless, the sub-

jective experience of the mothers with postpartum depression and postpartum psychosis is of great importance for the mother–infant relationship. Mother–child interaction is partly assessed by the experience of the mother and partly by the manner in which others observe this interaction. To prevent discrepancy between the experience of the mother and the observations of others, it is important to include both elements in research.

Clinical implications

The sample of the present study is highly unique in terms of rarity and severity regarding the mental health status of the mothers at a critical developmental period of their child. Previous research has rather neglected the study on postpartum psychiatric disorders, especially postpartum psychosis. Therefore, the present study has tried to open the discussion on the perceptions and behaviors not only of women with postpartum depression but also of women with postpartum psychosis.

Early assessment and appropriate treatment programs of postpartum psychiatric disorders are crucial because of their potentially harmful impact on both the mother and her child and the progressive nature of postpartum psychiatric disorders. According to the results of the present study, concentrating treatment on the experience of the bond with the child might be of less importance for women with a postpartum psychosis. Biological interventions and improvement of the perception of reality might be more important aspects in the treatment of women with a postpartum psychosis, since the results of this study tend to demonstrate that women with a postpartum depression experience more difficulties regarding the bond with their child compared with women with a postpartum psychosis. However, no conclusions can be drawn regarding the experience of the mother–infant interaction by mothers with postpartum psychosis in the long term. At this moment, follow-up studies are being conducted on the mother–child interaction and the development of the children of the women from the population of this study at the Erasmus Medical Centre. On the other hand, the results of the present study implicate that treatment that focuses on the experience of the mother, such as video interaction guidance, could be especially beneficial for mothers who suffer from a postpartum depression. Mothers seem to discover another image of themselves through watching themselves with their child on the video (Vik and Hafting 2006). By this means, false self-beliefs which lead to negative moods and behaviours can be corrected (Blackburn et al. 1981).

Further research in this area has to be conducted to increase the knowledge on the experience of the bond with the child by mothers suffering from a postpartum psychiatric disorder and the role of this experience in the recovery process. More specifically, it would be beneficial to study the possible differences in underlying factors between depression and postpartum depression. One of the most prominent differences is the presence of the newborn in postpartum depressed women and the co-occurring feelings and dynamics with respect to the child. As mentioned earlier, as a result of the present findings, the question arises whether it is the experience of the postpartum depressed mother regarding the bond with her child that is the first thing which improves or whether it is the depression itself that recovers first. The effectiveness of, for example, video interaction guidance should be studied to demonstrate the possible extra effect of the improvement of the mother–infant bond on treatment of women with a postpartum depression. It would be of vital importance for treatment procedures aimed at women with a postpartum depression when the underlying maintaining factors in depression and postpartum depression indeed show a difference. In this case, besides treatment of the depression, the co-occurrence of an adverse mother–child bond needs to be ameliorated as well.

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References

- Beck CT (2002) Postpartum depression: a metasynthesis. *Qual Health Res* 12: 453–472
- Blackburn IM, Bishop S, Glen A, Whalley LJ, Christie JE (1981) The efficacy of cognitive therapy in depression. *Br J Psychiatry* 39: 181–189
- Brandon S (1983) Depression after childbirth. *Health Visit* 56(1): 13–15
- Brockington IF, Oates J, George S, Turner D, Vostanis P, Sullivan M, Loh C, Murdoch C (2001) A screening questionnaire for mother–infant bonding disorders. *Arch Womens Ment Health* 3: 133–140
- Brockington IF, Fraser C, Wilson D (2006) The postpartum bonding questionnaire: a validation. *Arch Womens Ment Health* 9: 233–242
- Chandra PS, Bhargavaraman RP, Raghunandan VNGP, Shaligram D (2006) Delusions related to infant and their association with mother–infant interactions in postpartum psychotic disorders. *Arch Womens Ment Health* 9: 285–288
- Chaudron LH, Pies RW (2003) The relationship between postpartum psychosis and bipolar disorder: a review. *J Clin Psychiatry* 64: 1284–1292
- Field T, Healy B, Goldstein S, Guthertz M (1990) Behaviour-state matching and synchrony in mother–infant interactions of nondepressed versus depressed dyads. *Dev Psychol* 26: 7–14
- Forman DR, O'Hara MW, Stuart S, Gorman LL, Larsen KE, Coy KC (2007) Effective treatment for postpartum depression is not sufficient to improve the developing mother–child relationship. *Dev Psychopathol* 19: 585–602
- Guy W (1976) ECDEU Assessment manual for psychopharmacology, revised edn. DHEW Publication no. (ADM), 76-338. U.S. Department of Health, Education, and Welfare, Rockville, MD
- Hays P (1978) Taxonomy map of the schizophrenias, with special reference to puerperal psychosis. *Br Med J* 2: 755–757
- Hipwell AE, Kumar R (1996) Maternal psychopathology and prediction of outcome based on mother–infant interaction ratings (BMIS). *Br J Psychiatry* 169: 655–661
- Hipwell AE, Goossens FA, Melhuish EC, Kumar R (2000) Severe maternal psychopathology and infant–mother attachment. *Dev Psychopathol* 12: 157–175
- Hornstein C, Trautmann-Villalba P, Hohm E, Rave E, Wortmann-Fleisher S, Schwarz M (2006) Maternal bond and mother–child interaction in severe postpartum psychiatric disorders: is there a link? *Arch Womens Ment Health* 9: 279–284
- Kendell RE, Chalmers JC, Platz C (1987) Epidemiology of puerperal psychoses. *Br J Psychiatry* 150: 662–673
- Kuiper NA (1978) Depression and causal attributions for success and failure. *J Pers Soc Psychol* 36: 236–246
- Kumar R, Hipwell AE (1996) Development of a clinical rating scale to assess mother–infant interaction in a psychiatric mother baby unit. *Br J Psychiatry* 169: 18–26
- Lewinsohn PM, Mischel W, Chaplin W, Barton R (1980) Social competence and depression: the role of illusory self-perceptions. *J Abnorm Psychol* 89: 203–212
- Millis JB, Komblith PR (1992) Fragile beginnings: identification and treatment of postpartum disorders. *Health Soc Work* 17: 192–199
- Murray L, Cooper P (1997) Effects of postnatal depression on infant development. *Arch Dis Child* 77: 99–101
- O'Hara MW, Swain AM (1996) Rates and risk of postpartum depression: a meta-analysis. *Int Rev Psychiatry* 8: 37–54
- Reck C, Hunt A, Fuchs T, Noon A, Moehler E, Downing G, Tronick EZ, Mundt C (2004) Interactive regulation of affect in postpartum depressed mothers and their infants: an overview. *Psychopathology* 37: 272–280
- Righetti-Veltima M, Conne-Perréard E, Bousquet A, Manzano J (2002) Postpartum depression and mother–infant relationship at 3 months old. *J Affect Disord* 70: 291–306
- Robertson E, Lyons A (2003) Living with puerperal psychosis: a qualitative analysis. *Psychol Psychother* 76: 411–431
- Sit D, Rothschild AJ, Wisner KL (2006) A review of postpartum psychosis. *J Womens Health* 15: 352–368
- Vik K, Hafting M (2006) Video interaction guidance offered to mothers with postnatal depression: experiences from a pilot study. *Nord J Psychiatry* 60: 234–238
- Wang S, Chen C, Chin C, Lee S (2005) Impact of postpartum depression on the mother–infant couple. *Birth* 32: 39–44
- Warner R, Appleby L, Whitton A, Faragher B (1996) Demographic and obstetric risk factors for postnatal psychiatric morbidity. *Br J Psychiatry* 168: 607–611
- Wisner KL, Peindl K, Hanusa BH (1994) Symptomatology of affective and psychotic illnesses related to childbearing. *J Affect Disord* 30: 77–78