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Abstract

Aims: To examine if there was any association between mothers' and fathers' post-partum depressive symptoms and sense of coherence and perception of their child's temperament. The hypotheses were that parents with depressive symptoms: 1) have more often a poor sense of coherence, 2) perceive their child's temperament to be more difficult than parents without depressive symptoms.

Methods: A total of 401 Swedish-speaking couples of children born through the years 2005-2007 in the northern part of the county of Västmanland, Sweden were invited to participate in the study. The parents answered 3 questionnaires: at inclusion of the study, and after 3 and 18 months. The inclusion questionnaire included demographic data (n= 393 couples), at three months: the Edinburgh Postnatal Depression Scale, the Sense of Coherence Scale (n=308 couples) and at 18 months: the Infant Characteristics Questionnaire (n=272 couples).

Results: Depressive symptoms measured at 3 months, were reported by 17.7% of mothers and 8.7% of fathers, and correlated significantly between mothers and fathers within couples ($\rho = 0.165$, $p = 0.003$). Mothers and fathers with depressive symptoms had a poorer sense of coherence ($p < 0.001$, $p < 0.001$) and perceived their child's temperament as more difficult than mothers and fathers without depressive symptoms at 3 ($p = 0.028$, $p < 0.001$) and 18 months ($p = 0.145$, $p = 0.012$ respectively).

***Conclusions:* Early parenthood has been studied thoroughly in mothers, but few studies have included fathers. Identifying problems in early parenthood might help predict later problems exhibited by the preschool child, which might be prevented by supportive programmes.**

Keywords: Child temperament, Fathers, Mothers, Post-partum depression, Sense of coherence

Introduction

Becoming a parent is mostly a source of happiness, but not always. Post-partum depression is a serious mental health problem that can occur up to 1 year after the birth of a child [1]. The prevalence of post-partum depressive symptoms may be as high as 20% in women [1, 2]. In a Swedish study, the prevalence in women was 12.5% at 8 weeks and 8.3% at 12 weeks post-partum [3]. The prevalence in men has been studied less but is estimated to be up to 10% with a metaestimate during the 3-6 month postpartum period [4]. In women, the predictors of post-partum depression are prenatal depression, prenatal anxiety, life stress, lack of social support, history of previous depression and low socio-economic status (SES) [5]. In men, the predictors of post-partum depression are maternal postpartum depression [6], a personal history of depression [7] and the state of the marital relationship [8].

Post-partum depression affects the person as well as her/his child and marital relationship [6]. In both mothers and fathers, post-partum depression is negatively associated with positive enrichment activities with the child such as singing and reading [9]. The demands on a new parent to care for a child and manage household tasks can be difficult to bear in normal circumstances and are exacerbated by the disability associated with depressive symptoms [1]. Motherhood and fatherhood are gendered social constructions that are shifting from the mother's traditional responsibility for the care of and daily engagement with the child to the expectation that both parents share these responsibilities [10]. In Sweden, fathers' parental leave has increased by 50% during the past 10 years [11]. There is an association between the mother's sense of coherence (SOC) and depressive symptoms post-partum [12]. The SOC construct refers to factors that form the basis for successful coping with

stressors [13]. Depressed parents generally perceive that their offspring has a more difficult temperament than other children [14]. SES is a sociological classification describing the correlations between relative wealth and social status. Health and SES are related, and people in lower social status groups have the highest morbidity and mortality [15]. Psychological health of both the mother and father is important to that person, her/his child and the marital relationship. Early parenthood has been studied thoroughly in mothers, but few studies have included fathers, as in the present study. Identifying problems in early parenthood might help predict later problems exhibited by the preschool child, which might be prevented by supportive programmes.

This study examines whether there is an association between mothers' and fathers' post-partum depressive symptoms, SOC and perception of their child's temperament. The hypotheses were that parents with depressive symptoms: 1) have more often a poor SOC and 2) perceive their child's temperament as more difficult compared with parents without depressive symptoms.

Subjects and methods

Both mothers and fathers were included at the first visit to the CHC. At 3 and 18 months postpartum the parents were followed up. A total of 401 Swedish-speaking couples of children born through the years 2005-2007 in the northern part of the county of Västmanland, Sweden were invited to participate in the study. The target population was Swedish-speaking mothers and fathers of children born in 2004-2006 in a region that includes eight child health centres (CHCs) in the middle part of Sweden. The CHC nurses gave the parents oral and written information about the aim of the study and invited them to participate. A separate consent to participate in the study was obtained from each parent. The parents were told that it was important

for the questionnaires to be completed separately by each parent. In total, 401 mothers and 396 fathers (393 couples) answered the questionnaire with the demographic characteristic, which was distributed to the parents by the nurse at the first visit to the CHC and was sent back in a prepaid envelope by the parents. After 3 weeks, a reminder was sent by post, and a second reminder was given by telephone after 5 weeks. New questionnaires and return envelopes were sent to the parents' home by post 3 and 18 months after childbirth. At 3 months, 308 couples participated and at 18 months, 272 couples (Figure 1). The Central Research Ethics Committee of Stockholm granted ethical approval.

(Insert figure 1 here)

Measures

The questionnaire at inclusion of the study included questions about demographics including the parents' age, child's sex, first or not first child, educational level and SES. SES was divided into three categories: manual workers, non-manual employees and employers [16]. The parents answered the Edinburgh Postnatal Depression Scale, EPDS [17], the separate question 'Were you depressed after childbirth?' and the simplified three-item SOC scale, SOC-3 [18] when the child was 3 months old. At 3 and 18 months post-partum, the parents completed the Infant Characteristics Questionnaire, ICQ [19].

Post-partum depressive symptoms

The EPDS is a widely used, sensitive screening instrument for early detection of post-partum depressive symptoms [20]. The 10-item scale is scored 0-3 on each item, with a total score of 0-30. A higher score indicates more depressive symptoms. To estimate each parent's level of post-partum depressive symptoms, all questions in the

EPDS had to be answered. The scale has been validated in mothers [17, 21] and fathers [22]. Cox et al. [17] recommended a cut-off of >9 to identify a risk for depression and a cut-off of >11 to identify depressive illness of varying severity [17]. The 3-month questionnaire included the separate question ‘Were you depressed after childbirth?’ with response alternatives: ‘No, not at all’ (1 point); ‘Yes, somewhat’ (2 points); and ‘Yes, very’ (3 points).

SOC

In 1995, Lundberg and Nystrom Peck reduced Antonovsky’s original 29-item SOC instrument [13] to a three-question SOC-3 scale to simplify the measurement of SOC [18]. SOC-3 includes the following variables: comprehensibility: ‘Do you usually feel that the things that happen to you in your daily life are hard to understand?’; manageability: ‘Do you usually see a solution to problems that other people find hopeless?’; and meaningfulness: ‘Do you usually feel that your daily life is a source of personal satisfaction?’. These questions are answered ‘No’ (0 point); ‘Yes, sometimes’ (1 point); or ‘Yes, usually’ (2 points). The scoring was reversed for comprehensibility. For the three questions, the index is recorded as 0-6; a score ≤ 2 indicates a strong SOC and ≥ 3 a poor SOC [18].

ICQ

The ICQ measures the parent’s perception of her/his infant’s temperament and includes four subscales: *Fussy/difficult*, *Inadaptable*, *Dull* and *Unpredictable* comprising 24 items [19]. In the present study, as in other studies, only the *Fussy/difficult* subscale was used [23]. The *Fussy/difficult* subscale includes nine items scored from 1 (*low difficulty*) to 7 (*high difficulty*). A low score indicates a less difficult temperament [19]. The parent is asked to compare her/his child with

‘children on average’ with regard to easiness and difficulty, calming the child, the child’s temperament, the child’s ability to amuse one self and how other parents would perceive the child. The *Fussy/difficult* subscale has good validity and reliability, with an *alpha* coefficient of 0.79 when the child is 6 months [19] and has been used in several Swedish studies [23, 24].

Statistical analyses

The mother and father in a couple were considered dependent, and all analyses involving comparisons between mothers and fathers were thus analysed using statistical methods for paired data. Descriptive statistics were calculated for the demographic variables of parents’ age, child’s sex, first or not first child, educational level and SES. McNemar’s test was used to compare the occurrence of post-partum depressive symptoms between mothers and fathers. Spearman’s rank correlation method (*rho*) was used to assess the association between EPDS scores in mothers and fathers. Fischer’s exact test was used to assess the homogeneity of post-partum depressive symptoms for different educational levels and the occurrence of post-partum depressive symptoms and SOC-3 score. The Wilcoxon signed-rank test was used to analyse the occurrence of post-partum depressive symptoms and ICQ mean scores at 3 and 18 months. In these analyses, an EPDS cut-off of >9 was used. The separate question ‘Were you depressed after childbirth?’ was dichotomized by merging alternative answers 2 and 3. The homogeneity of this question and an EPDS score >11 was assessed using Fischer’s exact test. The Kruskal-Wallis test was used to analyse the differences in the SOC-3 mean rank index and ICQ mean score according to educational level. All analyses were performed using SPSS 17.0, 18.0

and 20.0, and a two-sided p-value of ≤ 0.05 was considered significant. Observations with missing values were excluded from the analyses.

Results

Table 1 includes demographic data on the parents' age, child's sex, first or not first child, educational level, SES for parents who scored >9 on the EPDS (i.e., at risk for depressive symptoms) and those with poor SOC.

Post-partum depressive symptoms among mothers and fathers at 3 months post-partum

More mothers 18% ($n = 59$) than fathers 9% ($n = 28$) scored >9 on the EPDS ($p = 0.001$). Depressive symptoms correlated weakly between the mothers and fathers within couples ($\rho = 0.165$, $p = 0.003$). Post-partum depressive symptoms did not differ according to the parents' age, child's sex, first or not first child, SES or mothers' educational level. Depressive symptoms were more common in fathers with senior high school educational level compared with those with higher education or 9-year compulsory school ($p = 0.048$) (Table 1). Ten per cent ($n = 33$) of the mothers and 5% ($n = 16$) of the fathers scored >11 on the EPDS. Among these parents, 73% of the mothers and 31% of the fathers gave a positive answer three months postpartum, to the separate question: 'Were you depressed after childbirth?'.
(Insert table 1 here)

SOC among mothers and fathers at 3 months post-partum

Eighty-eight per cent ($n = 296$) of mothers and 84% ($n = 278$) of fathers had a strong SOC. Twelve per cent ($n = 40$) of mothers and 16% ($n = 55$) of fathers had a poor SOC. SOC correlated weakly between the mothers and fathers within couples ($\rho = 0.122$, $p = 0.027$). SOC did not differ according to the parents' age, child's sex, first or not first child or SES. There was a difference concerning educational level and SOC among the mothers ($p = 0.009$), but not among the fathers.

Association between post-partum depressive symptoms and SOC at 3 months post-partum

A higher proportion of the mothers with self-scored depressive symptoms had poor SOC compared with those without depressive symptoms ($p < 0.001$). A similar pattern were observed in fathers ($p < 0.001$) (Table 2).

(Insert table 2 here)

Parents' perception of infant's temperament at 3 and 18 months post-partum

The mothers and fathers perceived their child as more difficult at 18 months compared with at 3 months: mothers mean ICQ score 3.29 vs. 3.01 ($p < 0.001$); and fathers mean 3.16 vs. 3.07 ($p < 0.001$). In the couples, the ρ correlation values between the mothers' and fathers' ICQ scores were 0.672 ($p < 0.001$) at 3 months and 0.515 ($p < 0.001$) at 18 months. The correlation between estimated ICQ scores at 3 and 18 months was $\rho = 0.393$ ($p < 0.001$) for mothers and $\rho = 0.402$ ($p < 0.001$) for fathers. The mothers' and fathers' ICQ scores did not differ according to the parents' age, the child's sex, first or not first child or SES. At 18 months, mothers with ≥ 3 years of university education had a higher ICQ score compared with mothers with compulsory school or a senior high school education ($p = 0.011$). ICQ

and educational level were not related for the mothers at 3 months or for the fathers at either time.

Association between post-partum depressive symptoms at 3 months post-partum and parents' perception of infant's temperament at 3 and 18 months post-partum

Mothers with depressive symptoms had a higher ICQ score compared with mothers without depressive symptoms ($p = 0.028$) at 3 months post-partum but not at 18 months ($p = 0.145$). The fathers with depressive symptoms had a higher ICQ score at 3 and 18 months post-partum than the fathers without depressive symptoms ($p < 0.001$ and $p = 0.012$) (Table 3). At 3 and 18 months post-partum, the EPDS and ICQ scores correlated weakly in mothers ($\rho = 0.182$, $p < 0.001$ at 3 months vs. $\rho = 0.181$, $p = 0.002$ at 18 months) and in fathers ($\rho = 0.252$, $p < 0.001$ vs. $\rho = 0.290$, $p < 0.001$).

(Insert table 3 here)

DISCUSSION

Main findings

Consistent with previous studies [1-4] more mothers reported post-partum depressive symptoms compared to the fathers. The mothers' and fathers' depressive symptoms correlated with poor SOC. Parents with depressive symptoms perceived their child to have a more difficult temperament compared with parents without depressive symptoms. This finding is consistent with that of a previous study [14]. Ostberg et al reported that the perception of one's child as *Fussy/difficult* is associated with parental stress [24], which could occur with depressive symptoms.

Depressive symptoms correlated between the mothers and fathers within couples, in accordance with Salmela-Aro et al. [8] described that couples with low marital satisfaction reported more depressive symptoms. Increased paternal depression is associated with maternal depression [6]. Depressive symptoms in one or two of a child's parents can adversely affect the child's development [1, 6, 25]. The mothers and the fathers who gave a positive answer to the separate question 'Were you depressed after childbirth?' scored >11 on the EPDS more frequently than did those, who answered that they were not depressed. This knowledge could be useful for CHC nurses working with new parents: just by asking this single question, the nurse may elicit important information.

The EPDS was created to identify post-partum depression among mothers [17] and is a useful tool to address mental health issues in health promotion and preventive work with mothers [26]. Whether the EPDS is an appropriate scale for detecting post-partum depressive symptoms among men is debatable. A lower cut-off may be more effective for identifying depressive symptoms in fathers. Matthey et al. recommend a 2-point lower cut-off for fathers than for mothers [22] because men are less likely to express negative emotions than women.

Mothers with compulsory school education had more often a poor SOC compared with mothers with other educational levels and with all fathers. Both mothers and fathers perceived their child as more difficult when the child was 18 months old compared with 3 months. This was the same for all parental educational levels, except for fathers with compulsory school. It is possible that men with a lower educational level are better able to resolve conflicts between life and work than are women with less education. On average, women have a disadvantage in the labour market because of less job security and lower salaries [27]. Parents might perceive

their child as more difficult because of other life demands such as work. Maybe a child demands more of her/his parents at 18 months than at 3 months and in most families, both parents work when their child is 18 months old. We observed a trend for more of the mothers and fathers who were ‘manual workers’ to have depressive symptoms and/or poor SOC compared with mothers and fathers without depressive symptoms and/or strong SOC. This agrees with the findings of Adler et al. [15] who reported that people with higher social status typically enjoy better health than do those with lower social status.

It is important for health-care providers to involve both mothers and fathers during pregnancy and early parenthood. Health care provided during antenatal care and in CHCs may benefit from employing professionals of both sexes; there are currently few male midwives and CHC nurses. However, men are leading father groups in some centres, indicating that alternative approaches are possible. Post-partum depression may be prevented or reduced through prevention of depression among young people, as predictors of post-partum depression include a previous history of depression [5, 7].

Strengths and limitations

The key strength in the present study is that both mothers and fathers participated, which provided the opportunity to compare the results between the mothers and fathers. Another strength is that parents from eight CHCs participated, thereby reducing the influence of individual nurses. The present study has some limitations. The EPDS was completed on only one occasion, so we could not document changes over time. However, we did examine how post-partum depressive symptoms were related to the parents’ interpretation of their child’s temperament at 3 and 18 months

and to the SOC-3 score at 3 months after birth. The optimal cut-off score is debatable. The EPDS cut-off of >9 increases the rate of identifying false-positive post-partum problems. However, when the scale is used in primary health care, the cut-off of >9 is recommended for routine examinations [17] and has been used in several other studies. A recent study showed an optimal cut-off score at ≥ 13 for detecting depressive symptoms during pregnancy used in primary health care (Rubertsson, 2011). Another Swedish study described that an EPDS score of 9-11 indicates high levels of stress, marital problems and perceived child difficulties [23]. We are aware of the lack of clinical assessment of depression of the parents in this study, which is regrettable. However, one advantage of an instrument such as the EPDS is that it requires only 5 minutes to complete and has a simple method of scoring [17]. Another limitation is that EPDS has sparingly been validated on men [22] and, to our knowledge, only on men from Australia. Not using the complete SOC scale may be a limitation of this study. However, the SOC-3 captures the essence of the original scale with satisfactory reliability, and its use might reduce the drop-out rate among parents who may be too tired to complete the entire questionnaire [18]. Another limitation is that only a subscale was used from the ICQ questionnaire.

Conclusions

Early parenthood has been studied thoroughly in mothers, but few studies have included fathers. Identifying problems in early parenthood might help predict later problems exhibited by the preschool child, which might be prevented by supportive programmes. This issue is interesting from a gender perspective and may lead to a more favourable development for the child and an improved situation for the family.

Further research is needed to examine post-partum depressive symptoms, especially among fathers, and the association between depressive symptoms and the impact on a child's development.

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